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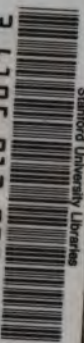
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THE
ENTOMOLOGIST

An Illustrated Journal

OF

GENERAL ENTOMOLOGY.

EDITED BY JOHN T. CARRINGTON, F.L.S.

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"When I Nature's wise instruction seek,
With light of power my soul shall glow."
—*Goethe*.

"To the attentive eye, each moment of the year has its own beauty. The tribes of birds and insects, like the plants, punctual to their time, follow each other, and the year has room for all.—*R. W. Emerson*..

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THE ENTOMOLOGIST.

Vol. XXII.]

JANUARY, 1889.

[No. 308.]

ON THE VARIATION OF INSECTS.

By T. D. A. COCKERELL.

At all times, and more especially of late years, the various deviations from the type-form presented by insects have excited considerable interest in the minds of entomologists; and, as a result of this, scarcely a number of an entomological magazine can be found which does not contain some reference to varietal forms. Nevertheless, the attempts to classify these numerous varieties have been very few, the most notable that I can recall being that of Mr. Jenner Weir in the 'Entomologist' (Entom. xii. 153), while little or nothing has been done towards ascertaining the causes of variation, or even recording the obvious accompanying circumstances.

The present paper is intended rather as an indication of the manner in which varieties may be classified than any final arrangement of them, and seeks to stimulate such interest in the matter that its suggestions may be put to the proof, and confirmed or discarded in favour of better ones. The varietal names used are, as far as possible, in accordance with the "Code of varietal nomenclature," already proposed in the 'Entomologist,' but many forms have had names applied to them by authors which are not the most convenient. These, in obedience to the law of priority, have been retained.

Class I.—COLOUR VARIETIES.

a. Intensification of Colour.

Examples.—*Pieris rapæ*, var. *novangliæ*, Scudd., and var. *manni*, Mayer. *Vanessa huntera*, var., with the (typically white) spot on the inner side of the black patch on the apex of the primaries yellowish (Maynard). *Bryophila perla-flavescens*, Entom. xx. 240; also "an orange variety," Proc. S. Lond. Ent.

Soc., 1886, 59; and "xanthic forms," *tom. cit.*, 63. *Arctia villica angelica*, B., *vide* Staudinger Catl.—In these examples yellow takes the place of white. No evidence is forthcoming as to the precise conditions under which this occurs, except that the yellow varieties of *Pieris rapæ* are said to be much more frequent in America than in Europe, and therefore probably the result of a different climate from that to which the species has always been accustomed in Europe, its native country. Much light, however, is thrown upon the probable nature of the change by the observation of Mr. Coverdale, repeated by numerous subsequent observers, that the white pigment of several species of Lepidoptera may be changed to yellow by the application of a caustic alkali.

Abraxas grossulariata lutea, Entom. xx. 278, is probably due to an extension of the normal yellow markings.

Arctia villica fulminans, Stgr.; locality, Syria.—This is the only instance I have of the change of the yellow pigment into red, and in this case there is always some indication of red about the typical form. The opposite case, that of a red pigment changing to yellow, is, as I have shown in a previous paper, by no means uncommon; nor is it confined to insects, being also witnessed in birds (Fringillidæ), mollusca (Tellinidæ), &c. Two other cases of change of colour may be mentioned here, as requiring further investigation,—*Ino staticea mannii*, Ld., and *Noctua subrosea subcærulea*, Stgr., the last, from Livonia and Finland, being rather a geographical race. An extraordinary variety of *Arge galathea* is also on record (Entom. xvi. 210), in which reddish and greenish take the place of black and white.

The above varieties differ notably from suffused, melanic, and other forms, in that they have their origin in a change in the nature of a pigment equally prominent in the type form, and not in the excessive development of an unaltered colour, as is the case with the following.

Hepialus humuli subrosea, ♂, Ent. Mo. Mag., 1881, 111.—Mr. Barrett, in describing this form, says the apical-third of the silvery white fore wings was distinctly tinged with a delicate pink (an extension of the pink of the apical cilia), which fades after death. This pink colour is evidently what Dr. Hagen (Ent. Mo. Mag., 1872, 78-83) described as hypodermal, the colours of this class being mostly bright and light, and fading after death of the insect. These hypodermal colours are supposed by Hagen to be produced by a photographic process, while the darker or sometimes metallic epidermal colours are due to a process of oxidation, and never fade after death.

It is strangely contradictory of this theory, however, that Mr. P. R. Uhler found by experiment that in specimens of the Heteropteron *Murgantia histrionica*, Hahn., those reared in the

dark showed a predominance of the pale red parts, while in those reared in bright daylight the dark blue colour predominated. (Rept. of U. S. Com. Agric., 1884, 309.)*

b. *Metallic colours.*

Anchocelis pistacina metallica; near Caterham, Entom. xi. 21.—This remarkable aberration was described as having on each fore wing a large patch of metallic cast, thus simulating the condition that is normal with some species of *Plusia*.

Colias edusa purpurascens, Entom. xi. 51.—Mr. E. A. Fitch, writing of this species, describes an aberration "beautifully shot with purple or blue," a condition which is quite normal in other species of *Rhopalocera*, notably some species of *Chrysophanus*.

c. *The development of green pigment.*

Venilia maculata viridimaculata, Entom. xi. 103. *Lasiocampa quercus olivaceofasciata*, Entom. xi. 103.—The change of the black markings to olive-green in the *Venilia* was accompanied by their partial coalescence. We know that the green pigment in *Geometra papilionaria* is first brown, and in *Pseudoterpnacytisaria* the final change to green frequently does not occur, producing the well-known brownish form of the species. It appears, therefore, probable that the above cases of *Venilia* and *Lasiocampa* represent the excessive metabolism of pigments which normally only attain the brown and black stages.

d. *Bleached and albino forms.*

Epinephele tithonus albidus, Entom. xi. 101. *Chrysophanus phloxas schmidtii*, Gerh. *Eusebia bipunctaria albida*, Entom. xvi. 170. *Hepialus humuli*, ♂, type.—In these cases white takes the place of another colour, and they are in no sense analogous to the white spotless varieties of *Abraxas*, &c. I am strongly inclined to suppose that the male type of *H. humuli* had its origin in a variety similar in character to the other three enumerated, and I accordingly class it with them.†

Epinephele ianira hispulla, Hüb., Entom. xi. 1; near Dover, &c. *E. tithonus pallescens*, Entom. xi. 229; xvi. 234; xix. 230. *Oporabia dilutata pallescens*, Newman, 'Brit. Moths,' 108. *Lycæna corydon albicans*, H.-S. *Melitæa aurinia sibirica*, Stgr. *Danaïs chrysippus alcippus*, Fab., "al. post.

* I am inclined to think that this experiment throws light on the reason that the hind wings of Noctuæ, which are under the fore wings, are nearly always pale, while those of *Rhopalocera* and *Geometræ* are generally concolorous with the fore wings.

† In the Mollusca I have shown that albinism, from being excessively rare and aberrational, may become common and even normal, though of course in hermaphrodite species it cannot become peculiar to a sex. Vide "The Variation and Abnormal Development of the Mollusca," in 'Science Gossip,' 1886.

albidis." *Nemeophila plantaginis hospita*, Schiff., "al. post. albis, nigro-maculatis." *Agrotis ripæ weissenbornii*, Frr. *Triphæna comes pallescens*, hind wings creamy white, Entom. xx. 240. *Coccinella septempunctata pallida*, pale yellow, Entom. xx. 237.—This appears to be rather a miscellaneous collection of varieties, but the information obtainable concerning them is not sufficient to class them more precisely at present. The pallid forms of *Epinephele* seem to be due simply to the non-development of brown pigment, whereas the pale *Coccinella* has almost certainly a different origin in arrest of development of the usually red pigment at its yellow stage, like the brown variety of *Pseudoterpna*. The var. *albicans* of *Lycæna corydon* might almost be called an albino. Mr. A. H. Swinton (Ent. Mo. Mag., 1885, 231) speaks of white *L. corydon* occurring on limestone plains in Spain, which is interesting as tending to confirm the theory that albinisms are of unusual frequency on limestone soil. In this connection it may be mentioned that Wollaston found that *Bembidium atlanticum*, Woll., was dark in Madeira, but much paler in Porto Santo, which is much more calcareous, and is strongly impregnated with muriate of soda.

e. *Dimorphism: light and dark forms.*

Heliothis peltigera pallida, Entom. xi. 24. *H. armigera*, a. *fusca* (Entom. xi. 24); b. *ochracea* (4th. Rept. U.S. Ent. Com., 1885, pl. iii., fig. 7); c. *umbrosa*, Grote, sp. *Tæniocampa gracilis rufescens*, Proc. S. Lond. Ent. Soc., 1886, 34, 35.—These are given as examples, but it is well known that many genera of brownish Noctuæ present light and dark varieties, which are often more or less local in their distribution; and a similar phenomenon obtains in certain Coleoptera, such as *Meligethes rufipes rufescens* (Ent. Mo. Mag., 1885, 217).

Limenitis disippus floridensis, Strecker, ground colour very dark. *L. arthemis rufescens*, reddish brown above as well as below (Maynard).—The first of these is a southern form in the United States, and it is worthy of note that there also occurs in the Southern States a distinct species, resembling the southern variety of *L. disippus* in its normal colour, but differing somewhat in the markings.

Hydræcia nictitans; a. *typica*; b. *erythrostigma*, Haw. *Anomis texana*, Riley; a. *fuscostigma* (4th Rept. U. S. Ent. Com., pl. ii., fig. 6); b. *albastigma* (loc. cit., fig. 6a).—The dimorphism in the colour of the stigma in *H. nictitans* is familiar to every British entomologist; it is, therefore, interesting to find a closely analogous case in a moth from Texas.

f. *Dimorphism confined to one sex.*

Colias edusa helice, ♀, Hb. *C. helice pallida*, ♀, Entom. xi. 51. *C. erate pallida*, ♀, Stgr. *C. aurora chloë*, ♀, Ev.

C. eurytheme pallida, ♀, Ckll. *C. philodice alba*, ♀, auctt. sp. Maynard. *C. electra pallida*, ♀, Grahamstown, Proc. S. Lond. Ent. Soc., 1886, 60. *Papilio turnus glaucus*, ♀, L. Pamphila zabulon pocahontas, ♀, Scudd. *Callidryas sennæ pallida*, ♀; dirty whitish yellow (French, 'Butt. of E. N. Amer.').—These are all dimorphic female forms, and I think, however looked at, their interest cannot be exaggerated. The first question that arises is, Are they atavisms? Do they represent the primitive condition of the species? This at first sight appears not very improbable, but I think we may answer it in the negative. It is not altogether impossible that reversion to the type should be confined to the female, yet it is, I imagine, somewhat unlikely; but what seems to weigh most against the theory of atavism is, that certain species of *Papilio* are trimorphic in the female sex, and these, at any rate, obviously cannot be explained by atavism.

Now we have seen above, under "light and dark forms," that some measure of dimorphism may obtain apparently without the slightest reference to sex, climate, or food, of which *Hydræcia* and *Anomis* are good examples; and we shall see below that characters peculiar to the one sex, occasionally appear in the other; that is to say, one sex, in very rare instances, presents a dimorphic form similar to that which is normal with the other. Suppose, then, a "spontaneous" (that is to say, without reference to general external circumstances) variation to occur, as it is I think certain that they do occur, is it unreasonable to suppose that it might become, either from sexual selection or from physiological causes, more prevalent in the one sex than the other? Further, might it not gradually become peculiar to the sex, until it was the normal condition? This seems to me the explanation of secondary sexual characters in the Lepidoptera, if not in all other organisms; and I regard the pale females of *Colias* and *Callidryas sennæ*, and the dark female of *Papilio turnus*, as forerunners of what is in the future to be the typical female of each respective species. In one case at least, this final process can be traced. The male of *Callidryas sennæ* is clear lemon-yellow, while the female is either of the same colour as the male, or of a dirty whitish yellow colour. In *C. agarithe*, the male is clear light orange, while the orange form of the female having apparently become extinct, the typical colour of that sex is dirty whitish yellow, like the dimorphism of *C. sennæ*.

Lycæna pseudargiolus (violacea) nigra, ♂, Edw. *Lycæna bellargus nigra*, ♂, Proc. S. Lond. Ent. Soc., 1886, 61.—These are cases of dimorphism in the male, a rare condition. Maynard states that black females of *L. pseudargiolus* are occasionally found, so this condition would seem not to be strictly peculiar to the one sex.

g. *A combination of two forms in one insect.*

Lycæna ægon duplex, "a specimen having the right-hand wings plain brown, and those on the left-hand blue; at first sight it had the appearance of an hermaphrodite, but was, in reality, a female combining the two forms of that sex." Exhib. by Mr. Bond at Ent. Soc. (Ent. Mo. Mag., 1873, 200). *Colias edusa duplex*, upper wings like *helice*, lower typical; or left side typical, and right *helice* (Entom. xi. 52, and August, 1876). *Meligethes rufipes duplex*. Thorax and one elytron typical, the other elytron reddish (Ent. Mo. Mag., 1885, 217).—It seems excessively strange that two forms should ever be combined in the same insect in this manner, yet the very ordinary phenomenon of the upper wings differing from the lower is, in some degree, analogous. And further, a character normally peculiar to one set, may become also abnormally developed on the other* (see for instance the variety of *Leucania conigera*, with the left lower wing marked like the typical upper wings (Entom. xi. 169, and col. fig.). Now supposing this very rare aberration were in any case to become frequent and at length typical, say by the development on all four wings of the spots formally confined to the upper, a specimen reverting to the ancestral type would be in many respects similar to the specimens mentioned above, and entirely so if there existed at the same time a spotless variety.

Looking at the question from this point of view, it even seems remarkable that no permanent variety has been developed in which the right side differed from the left, but doubtless the laws of correlation have prevented this. Mr. S. Webb, however, gave me some very interesting statistics concerning species of *Lycæna* and *Epinephele* in his collection, tending to show that a perfect similarity of the opposite wings was the exception rather than the rule; and my own observations on *E. hyperanthes* lead me to believe that the ocelli are, on the average, better developed on one side than the other; but until I have examined a larger amount of material I cannot say definitely. I am sure all entomologists would be much indebted to those who have long series of this insect, and of other spotted or ocellated forms, if they would work out this matter and publish their results.

* Characters peculiar to one side may also be developed on the other; for example, *Epinephele hyperanthes*, with ocelli developed on the upper side (Entom. xix. 71).

(To be continued.)

[At the request of Mr. Cockerell, the trinomial system of nomenclature is used in this article.—ED.]

THE INFLUENCE OF METEOROLOGICAL CONDITIONS UPON INSECT LIFE.

By ROBERT ADKIN, F.E.S.

MR. WHITE suggests, in his notes on this subject (Entom. vol. xxi. p. 217), that the influence of irregular or intermittent temperature upon the emergence of insects has received less attention than it deserves. No doubt this is so, and probably one great reason for such being the case is the difficulty of obtaining reliable data to work upon. Accurate meteorological records, it is true, are accessible in a conveniently tabulated form for reference, not only temperatures, but also the amount of sunshine, rainfall and other matters calculated to affect insect development being given in detail. But can we place equal reliance upon our entomological observations? Are there not many other conditions, besides those meteorological, that may escape our observation and yet have an important bearing upon the question?

Notes of emergence in our breeding-cages, for instance, appear to me likely to be particularly misleading. The conditions under which insects are so kept, are to a greater or less extent artificial. This is especially so in the case of subterranean pupæ. In nature these are surrounded by a considerable body of earth, which serves as a natural protection against rapid changes of temperature, whereas under the artificial conditions of the usual breeding-cage they have at best but a few square inches of soil around them. Further, given, as is frequently the case, that this soil is contained in a porous earthen pan, which from any cause has become moistened, it is probable that a refrigeratory action would be set up by evaporation, which would create an abnormally low temperature in the interior of the vessel containing the pupæ, possibly resulting in late emergences from purely artificial causes. As an example I will give the following tabulated statement of the behaviour of three consecutive broods of *Ptilophora plumigera*, a species that performs the whole of its metamorphoses during what are usually the warmer months of the year. They were reared under as nearly as possible similar conditions; the cages containing them being kept in a well-lighted outhouse, fully exposed to the air, but sheltered from rain:—

	1886.	1887.	1888.
Ova hatched	April 26.	April 21.	May 6.
Larvæ full-fed	May 28.	June 9.	June 10.
First imago emerged...	Oct. 9.	Nov. 9.	Oct. 26.
Chief emergence	Oct. 24.	Nov. 26.	Nov. 3.
Last emergence	Nov. 21.	Dec. 3.	Nov. 11.

Assuming for the sake of argument that warm seasons induce early emergences, we should expect to find the appearance of

imagines in the past admittedly cold season later than in the former years, whereas it is considerably earlier than after the warm summer of 1887, and in the average but little later than in 1886. On the whole such data appear to me calculated to mislead, and should be accepted, if at all, with great caution.

Field notes are not open to the same objections. Carefully recorded observations of the appearance of many species under their natural conditions should be of considerable value in elucidating the question, and not difficult to obtain from those who are able to make frequent notes in a locality at stated periods. Species that usually occur in considerable numbers should be the best for observation, and comparison between the times of appearance of the same species in different localities must not be taken to indicate an earlier or later general emergence. I may perhaps best illustrate my meaning in regard to this suggestion with notes extracted from my diary, of the appearance of the second brood of *Lycæna bellargus*, for the years 1887 and 1888. The first note I have in 1887 is that it was taken at an inland locality on August 8th, by a friend with whom I was in frequent communication. At this date I was staying on the Sussex coast and daily expecting to meet with the species, but it did not appear until the 28th of the month. This year I was on the same coast-ground throughout the month of August and until September 12th; a sharp look-out was kept during the whole time, but up to the last date not a specimen was to be seen. It cannot be supposed that the brood was this year completely suppressed; and although the record is incomplete by reason of the species not being found, it appears to be clear that in this one locality it was at least fifteen days later than in 1887, but it would be manifestly unfair to draw a comparison between the inland and coast localities. Insects that have a rapid succession of broods are difficult to deal with, as there is with them the possibility of the end of one brood so overlapping the commencement of another as to render comparison untrustworthy.

Mr. Griffiths's note (Entom. vol. xxi. p. 283) affords me an opportunity of illustrating the difficulty of dealing with successively-brooded species. Is he right in assuming that the capture of "three fresh specimens" of *Tephrosia crepuscularia* on July 5th is indicative of a comparatively late emergence? There is, I believe, no doubt as to the double-broodedness of this species, the first brood appearing in March and April, the second at the end of June and early in July. Is it not then quite as likely that these specimens should be referred to the second as the first brood? and in that case their time of appearance would be normal.

The difficulties in the way of working out so interesting a

subject should not, however, be insurmountable; and there ought to be, with some little care in the selection of suitable observations, a sufficiency of reliable data forthcoming to enable Mr. White to prosecute his task to a successful conclusion.

Lewisham, December, 1888.

CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.

By J. W. TUTT, F.E.S.

(Continued from vol. xxi., p. 313.)

Axylia, Hb., *putris*, L.

The type of this species is described by Linnæus as:—"Noctua spirilinguis cristata, alis deflexis obsoletis subpunctatis, margine exteriori fusco adjecta macula subocellari." "Color ligni putride, ut in exsoleta s. verbasci, sed brevis." ('Systema Naturæ,' p. 850, No. 152). Haworth describes the species as, "Alæ pallidæ sive flavicantes costâ late fuscâ," &c. ('Lepidoptera Britannica,' p. 172, No. 34); and Guenée, again, describes it as, "Superior wings of a very clear, pale yellow, with the costa broadly brown," &c. ('Noctuelles,' vol. v. p. 134). Hübner figures the species under the name of *lignosa*, and his figure (245, by error 215) is not quite typical, the anterior wings being "yellowish ochreous with black markings." Newman, in his 'British Moths,' p. 282, describes the species as "pale wainscot-brown with dark umber-brown markings." These seem to be the chief points of variation, viz., the ground colour varying from whitish or pale yellowish to dark ochreous or wainscot-brown, and the markings from brown to black. I have both forms in my cabinet. Those with typical pale yellow wings and black markings would appear to be the *sicca* of Guenée. Mr. Russ has sent me a specimen from Sligo with a distinct dark shade, reaching from the base of the reniform to the inner margin.

α. var. lignosa, Hb.—Ground colour yellowish-ochreous instead of pale yellow or whitish; the ordinary markings black instead of brown, much irrorated with fuscous dots. A full description of Hübner's *lignosa* would be, "Anterior wings with the ground colour of a yellow ochreous shade, with a black basal streak, the orbicular and reniform outlined in black; a double transverse line of dots beyond the reniform; the median nervure continued through the wings as a dusky shade; a broad black costal streak runs along from the base of the costa to the apex where it ends; two short dusky shades are placed in the upper part of the outer margin. Hind wings grey, with the outer margin slightly ochreous." Newman's figure, 'British Moths,' p. 282, is much too dark for the type, and apparently belongs to this variety.

(?) *β. var. sicca*, Gn.—Guenée describes a species under the name of *sicca* as follows;—"A little smaller than *putris*, the superior wings of which

species those of *sicca* much resemble, if it were not that the costal streak is more black than brown, above all between the two stigmata, where they form a distinct black spot. Inferior wings entirely pure white. Head, thorax and palpi pale yellow. I have only a single male of which I am ignorant of its locality" ('Noctuelles,' vol. v. p. 135). The pure white hind wings leave me in doubt as to the specimen being a variety of this species.

Xylophasia, St., *sublustris*, Esp.

This species has been much mixed up with *lithoxylea*, many of our early authors treating them as the same species. Hübner figures (240) a red variety of *sublustris*, which he calls *lithoxylea*; and Haworth, in his 'Lepidoptera Britannica,' p. 169, No. 25, writes with reference to this figure, comparing it with *lithoxylea*, "at magis ferruginea"; but as he does not attempt to separate it from *lithoxylea*, British *sublustris* may not have been known to him. Guenée, in his 'Noctuelles,' vol. v. p. 139, states that "Treitschke has confounded the two species, and has cited their synonymy very indistinctly." On p. 140 Guenée also writes, "Is this a separate species, or only a variety of *lithoxylea*? . . . It is constant in markings and character." He then writes:—"Its colour is always more red, and the discoidal spots much better marked; the inferior wings have a very distinct brown discoidal line between the lunule and the hind margin." These characters are distinct, and I think the difference in the hind wings of *lithoxylea* and *sublustris* well worthy of notice.

This interesting species is very variable on the coast of Kent, and specimens exhibit much difference both in the ground colour and the depth of the markings. Most of the specimens have the anterior wings of a pale ochreous-grey ground colour; others are decidedly yellowish ochreous, and these lead up to a very distinct form with the ground colour decidedly tinged with red. With respect to the markings, there is also a very great difference. Some specimens have the characteristic markings in the central part of the wing and on the outer margin very faint, and merging into the ground colour; others have them distinctly marked in dark greyish brown; others have them marked in deep brown; while the form mentioned above, with the red ground colour, has them in a clear reddish brown or rust-red, shaded off into the paler ground colour. The specimens also vary with regard to the transverse row of spots parallel to the hind margin; some specimens have these spots absent, some well developed, and some have them joined by curved arches, making a wavy line exactly of the same character and shape as the second transverse line in the allied species *polyodon*, L. (*monoglypha*, Hufn.). But the most remarkable specimen I have is one with the whitish ground colour of *lithoxylea*, with all the markings of *sublustris* most clearly developed, even to the wavy line mentioned above. There is a great amount of difference also in the quantity of dark scales

with which the anterior wings are sprinkled. This makes some specimens look quite melanic compared with others. But dark as some of our specimens are, we do not appear to obtain (after making all due allowance for the artistic demerit) any specimens so dark as Esper's type. Esper's fig. 1 ('Die Schmetterlinge,' &c., pl. cxxxiii.) is the type, and, although bad enough, is recognisable at once as an exceedingly suffused form of this species. I have made the following description of his figure:—

"Probably a female (Esper calls it a male). Anterior wings dark ochreous, entirely suffused for two-thirds of the wing from the base with dark fuscous, except along the inner margin, where the ground colour is more noticeable; the outer one-third of the wing, from the apex to the inner margin, paler; this paler area with a double transverse row of dots parallel to the hind margin, and also a pair of dots near the edge of the inner margin at about one-third from the base;* the nervures with a slight purplish tinge; the hind margin dark fuscous. The hind wings dark grey, the base a little paler, with a slight purplish tinge."

It will at once strike those who have a short series from our south coast how unlike this description is to our usual forms; and yet when one looks at Esper's figure one recognises at once that it is *sublustris*. I have only seen one Irish specimen, and that is quite as dark as, perhaps a little darker than, the darkest I have from Deal. Besides this very dark type, we in Britain appear to get two very distinct forms, which are comparatively rare, these extremes being joined by intermediate specimens, which vary much, *inter se*, both in the depth of the ground colour and markings, although of a general greyish ochreous hue. These forms I shall call:—

α. var. pallida, mihi.—Ground colour whitish-ochreous, inclining to the pale colour of *lithoxylea*, the dark shades very distinct and standing out clear in the pale ground colour; the transverse markings very distinct, a transverse wavy line being formed by the union of the transverse row of dots parallel to the hind margin, with lunular arches. Hind wings dark grey, with a distinct lunule, a pale transverse line outside the lunule, then a dark transverse shade followed by another pale marginal line. I have only occasionally captured specimens of this variety at Deal.

β. var. intermedia, mihi.—Intermediate between *var. pallida* and the red *var. lithoxylea* of Hübner. Ground colour yellowish-ochreous, with a dark grey tinge, the typical shades variable in depth of colour, and the transverse lines also variable in the extent of their development. This is the ordinary British form.

γ. var. lithoxylea, Hb.—This must not be confounded with the *lithoxylea* of Fab., which is a distinct species. Hübner's fig. 240 may be described as follows:—"Anterior wings bright ochreous with a reddish tinge, a bright red shade between the stigmata, and another bright red shade along the

* These two dots are very unusual in *sublustris*, although common in *lithoxylea*. I have one specimen of *sublustris* with both developed, many with one, but the greater number of my long series have neither.

hind margin; a series of black dots on the pale nervures beyond the reniform area. Hind margin of the hind wings dark ochreous, with a dark transverse shade and lunule." This is a very distinct form, with the ground colour redder than the type, and the ordinary dark shades of the type of a distinctly bright rust-red colour. I have looked over and captured a large number of this species at Deal, but this form must be considered rare there, as I have taken but few of them. I have seen odd specimens amongst those taken by the Folkestone collectors, and I dare say a larger number would occur there, as the species is very abundant.

Xylophasia, St., *lithoxylea*, F.

So much uncertainty prevails with regard to the *lithoxylea* of the 'Vienna Catalogue,' which gives no description, that the *lithoxylea* of Fabricius ('Mantissa,' p. 182) is generally accepted as the type of the species. This description is as follows:—"Noctua cristata alis deflexis dentatis, cinereis fusco maculatis; margine postico fusco." "Corpus cinereum. Thorax dorsali brunnea. Alæ anticæ dentatæ cineræ maculis punctisque obsoletis fuscis. Margo posticus tenuissime fuscus. Subtus cineræ margine tenuiori nitido. Posticæ cineræ margine postico fusco, subtus immaculatæ."

Hübner figures the very red form of *sublustris* as *lithoxylea*. It is a species which varies but little, so far as I know; some specimens appear to be a little more suffused with dark scales than others, but generally the paler specimens show undoubted traces of wear. The specimens which I have from Greenwich, Strood, Deal, Sligo, and northern British localities, show no variation worth mentioning. Haworth, in his 'Lepidoptera Britannica,' p. 169, gives a good description of this species; but he accepts Hübner's fig. 240 as this species, with the remark "at magis ferruginea," although it is undoubtedly *sublustris*. Guenée also states in his 'Noctuelles,' vol. v. p. 139, that "some lepidopterists have supposed *lithoxylea* a variety of *polyodon*." This will give some idea of the closely-allied character of this group when studied through their varieties.

(To be continued.)

THE INSECT FAUNA OF ST. KILDA.

By C. W. DALE, F.E.S.

At the September meeting of the Entomological Society, Dr. Sharp recorded a list of nine species of Coleoptera from St. Kilda. To that list I can add seven others.

The Coleoptera of the Isle now consist of:—*Elaphrus lapponicus*, *E. cupreus*, *E. uliginosus*, *Carabus catenulatus*, *C. granulatus*, *Nebria brevicollis*, *N. gyllenhalii*, *Calathus*

cisteloides, *C. fuscus*, *C. mollis*, *Pristonychus terricola*, *Pterostichus nigrita*, *P. niger*, *Amara aulica*, *A. communis*, *Ocypus olens*, *Byrrhus æneus*, and *Geotrupes sylvatica*.

The Lepidoptera are:—*Cœnonympha pamphilus* (the only butterfly), *Anaitis plagiata*, *Crambus culmellus*, *Bactra lanceolana*, and *Glyphipteryx cladiella*.

The Trichoptera are:—*Limnophilus auricula*, *Polycentropus irroratus*, and *Berœa pygmæa*.

The Diptera are:—*Microphorus crassipes*, *Dolichopus atratus*, and *D. nubilis*.

The Hemiptera are:—*Lygus pratensis* and *Athysanus obscurellus*.

The Orthoptera are represented by only *Forficula auricularia*.

I can fully endorse Dr. Sharp's remarks of the specimens showing no signs of depauperation, and being scarcely distinguishable from ordinary English specimens.

My information comes from an account of the Isle of St. Kilda, by John Macgillivray, 1840; and also from a visit paid there by myself on July 28th, 1883. St. Kilda is the most westerly of the Hebrides, and is situated far out in the bosom of the broad Atlantic, eighty miles west of the Butt of the Lewis, and belongs to Macleod of Macleod. The isle is very bare, being closely fed down with sheep and cattle, and I did not find a single bramble. The cliffs are of stupendous height; one of them, Conacha, is about 1300 feet high. There are about seventy or eighty inhabitants. An immense number of sea-birds make it their head-quarters, such as solan geese, fulmar petrels, puffins, &c. In 'The Zoologist' for 1886, p. 333, is an account of a new species of wren. I saw it when there, but did not know it was different from the common one. Amongst plants I observed the corn-marigold, primrose, bog-pimpernel, and cotton-rush.

Glanvilles Wootton, Sherborn, Dorset, Nov. 5, 1888.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

COLIAS EDUSA var.—Mr. J. Anderson, jun. (Entom. xxi. 272), speaks of a "primrose-coloured" *Colias edusa* var. *helice* in Sussex. It is true that *helice* is not an albino, but it is not of the vivid yellow characteristic of a well-coloured primrose. Will Mr. Anderson give a fuller description of this insect? for if it proves to be a yellow var. of *C. edusa*, comparable to the var. *eriphyle* of the American *C. eurytheme* (see Entom. xxi. 189), I need hardly say, that its interest and value from a biological point of view is very great.—T. D. A. COCKERELL; West Cliff, Colorado, November 27, 1888.

VANESSA URTICÆ var.—On the 16th of October last my mother caught at Exmouth, S. Devon, a specimen of *Vanessa urticæ* which strongly resembles the first variety figured in Newman's 'British Butterflies.' The insect is

rather smaller than the type, and the two black spots in the centre of the anterior wings are very indistinct, the upper one being very nearly invisible, and the lower one much smaller than in the typical form: the black spot on the inner margin of the fore wings is also smaller than in the type. I have also a specimen of this insect in which the right hind wing is darker than the other wings, and is without the usual marginal row of blue spots. I am unfortunately unable to give the date or place of capture of this latter insect.—HENRY A. HILL; 20, Fellows Road, Hampstead, N.W., November 16, 1888.

VANESSA URTICÆ var.—I captured a *Vanessa urticæ* with the left fore wing of a white colour and the rest of the butterfly presenting the usual appearance, in the old chalk-pit known as "Thunor's Leap," on August 1st, 1888. *Vanessa cardui* was a common butterfly at Ramsgate during the past season. In 1887 I did not notice it at all.—A. H. SWINTON; Tudor Villa, Gery Street, Bedford.

DEILEPHILA GALII IN CHESHIRE.—From September 4th last to the 19th, I sent two or three of my family to the sand-hills, Wallasey, to search for larvæ of *Deilephila galii*. They were there on eight occasions, and collected thirty-five larvæ. Between a friend and myself I kept twenty, distributing the remainder amongst my entomological friends. The twenty I kept in a warm kitchen, and on October 29th the first imago emerged, a splendid specimen. Others shortly followed, but early in November three cripples appeared, one after another. This somewhat alarmed me, as I was afraid I was drying them too much. I however sprinkled a very little warm water over them, but only did this once. Since then all have emerged in splendid condition, with the exception of three still in pupa. The last to emerge was on December 9th. The result of the twenty larvæ was fourteen fine specimens, three cripples, and three still in pupa.—SAMUEL JAMES CAPPER; Huyton Park, Liverpool, December 16, 1888.

DEILEPHILA GALII AT ETON.—At dusk on the evening of July 23rd, 1888, a student brought me a fine *D. galii* he had just captured in a corridor on the first floor, into which I presume it had flown through the open window. It appeared to be newly emerged, being quite perfect. Can any reader inform me if it has been taken in this district before?—J. C. O. BLAIR; Mr. Tarver's, Eton College, Windsor. [Among the many places of recorded capture of this insect in 1888, Reading appears to be the nearest locality to Eton.—ED.].

DEILEPHILA GALII IN DERBYSHIRE.—On July 21st, 1888, my son, aged eleven, caught a female *D. galii* hovering over flowers in our garden here. He also took a male specimen, within ten minutes later. I have been collecting for the last twelve years, but never before heard of the species occurring in this county. I have a specimen of *Sphinx convolvuli* measuring five inches, taken near here in 1884, which is the only one I have heard of in this district.—R. C. BINDLEY; Mickleover Vicarage, Derby, November 30, 1888.

LITHOSIA COMPLANA.—With regard to Mr. Jeffery's query (Entom. xxi. 322) as to *Lithosia complana* being captured on the sandhills of the Carmarthenshire coast, and asking whether this was not an uncommon

situation, I should say, as far as my experience goes, that it is nearly its only situation. The whole of my series of some ten specimens are all labelled "Deal coast"; and although I have had a number of specimens sent me from inland localities, I have never had any hesitation in rejecting them as *complana*, and putting them in my series of *lurideola* (*complanula*). I have seen *complana* (female) drying its wings within twenty yards of the sea, and probably one to two miles distant from any trees, and certainly in this case *complana* did not feed on tree lichens, although it may have done so on rock lichens. I feel pretty well satisfied that *pygmæola* is not a lichen feeder, although I have hitherto failed to breed it. In the 'Entomologist,' x. 46, 47, is an interesting account of the life-history of *L. molybdeola*, and there the Rev. P. H. Jennings gives lichens, chickweed, lettuce, dandelion and sallow as food-plants for this species. I think our *Lithosidæ* are much more general feeders than they are usually considered to be.—J. W. TUTT; Rayleigh Villa, Westcombe Park, Blackheath, S.E.

MELANIC VARIETY OF *AGROTIS CORTICEA*.—In the 'Entomologist' (xxi. p. 285) is a statement that "Mr. Goss exhibited, for Mr. W. J. Cross, an extraordinary melanic variety of *Agrotis segetum*, caught by the latter gentleman near Ely, in July last." Mr. Cross, dissatisfied with the result arrived at in the meeting, sent the specimen on to me. There is not the slightest doubt that the specimen is *Agrotis corticea*, not *A. segetum*, and although the variety is perhaps, in a small degree, "extraordinary," I have repeatedly captured specimens of the same form, with a large number of other varieties of the same species, at Deal, during the month of July in the years 1884-88.—J. W. TUTT.

AGROTIS AGATHINA.—On Sept. 3rd I took a fine specimen of *Agrotis agathina* at sugar. As I have never taken it before, and as several of my correspondents have never known it taken in that way, I should like to know how it is usually taken.—W. E. BUTLER; 91, Chatham Street, Reading. [By searching the flowers of heather-bloom with a light at night. They prefer bloom sheltered by tress.—J. T. C.]

CALOCAMPA SOLIDAGINIS.—We take this species in the same manner as that mentioned by the Rev. C. Thornehill (Entom. xxi. 277), and it also comes freely to sugar. I met with it in the latter way for the first time this season on August 25th. In the locality where *C. solidaginis* is most frequently met with, there are only three birch trees, the moths either resting on bracken branches, heather stems, or on some palings there, which are about a foot from the ground, and rarely on the trunks of the birches.—A. E. HALL; Norbury, Sheffield, November, 1888.

XYLOPHASIA MONOGLYPHA var.—While sugaring here on July 10th I took a fine dark variety of *Xylophasia monoglyphæ*; as far as I can see, the same as the second figure in Newman's 'Natural History of British Moths.' I have not known this variety to occur in this locality before, though I have collected here for three years or more, and seen many hundreds of the type.—SPOTSWOOD GRAVES; 29, Victoria Street, Tenby, July 25, 1888.

VENILIA MACULARIA var.—During a short visit to Lynmouth, North Devon, in July last, I took a specimen of *Venilia macularia*, of the variety

described by the Rev. J. S. St. John (Entom. xx. 41).—R. H. THOMPSON; 50, Parsonage Road, Withington, near Manchester, December 8, 1888.

CIDARIA RETICULATA.—I come to the conclusion, that the reason *Cidaria reticulata* is so rare an insect is owing to the larvæ feeding so late in the autumn on a food-plant so tender as *Impatiens noli-me-tangere*. I could never get the larvæ to eat any other plant, and would not at all be surprised if this species soon becomes extinct, owing to early frost and snow: with us notably on 1st October, 1888. I have never been able to succeed in rearing the larvæ of *C. reticulata*, although I have tried hard, and have gone almost daily for the food for them. I was successful in breeding it this season, for knowing they made up amongst the loose rubbish about the plants, I determined to try another plan. I went late in the season and collected bags of rubbish from about where I knew the plants had been growing, and was rewarded by rearing a very nice series. I am afraid it will be no use trying the same this winter. I went on the 28th of September to see if there were many plants, and found one corner had a nice bed of them in it. I had a good look for larvæ, and found three, but not nearly half-grown. Being so small, I placed them on a marked plant, and left them. A few days later the frost and snow came, so I went up again at once, knowing the plant was so easily killed, and found every plant cut to the ground. After some looking, I came across two larvæ wandering about. Not knowing what to do with them, I came to the conclusion forthwith to send them to the Rev. B. Smith, of Marlow, who had written to me that he could not help thinking the larvæ might be got to eat something else. I have had a note from Mr. Smith since, to say he had failed with those I sent. I can see one chance for *C. reticulata*, which is that some may stay more than one year in the pupa state; otherwise there is but little chance for it.—H. MURRAY; Lowbank Villas, Carnforth, December 5, 1888.

PENTHINA POSTREMANA.—I was fortunate enough to breed a very nice series of *P. postremana* from *Impatiens noli-me-tangere* last season.—H. MURRAY; Lowbank Villas, Carnforth, December 12, 1888.

THE GENUS *SCOPARIA*.—Two more seasons have passed since my last note on this subject (Entom. xxi. 17), and little or nothing has been done towards further elucidating this genus, except that Mr. P. B. Mason and Mr. G. C. Barrett have at length given in their adhesion to the opinion I expressed (Entom. xviii. 130) that *S. gracilis* should be merged in *S. alpina*. Will none of my brother entomologists in Scotland assist me in working out the question of the specific identity of *S. ambigualis* and *S. atomalis*? Convinced as I am of their identity, I cannot satisfactorily prove it from lack of material. We know that *S. ambigualis* is abundant throughout England and Scotland, up to the Highlands, where, as in the Hebrides, the Orkneys, and the Shetlands it disappears, and its place is taken by *S. atomalis*, which has never occurred in the south, with the exception of a single specimen recorded from Wales by Mr. Gregson ('Intelligencer,' i. p. 31); and this we are particularly told was much lighter in colour than the Scotch specimens. On the west coast of Argyshire and the small islands in the Sound of Jura, Mr. Howard Vaughan and I have taken, nearly on the sea-level, specimens of an intermediate character; and if entomologists working in Scotland, especially near the junction of the Highlands and Lowlands, would but collect these species for comparison,

the matter would speedily be settled. I have worried all my friends and correspondents, and also advertised, but all to no purpose. As regards the rest of the genus, nothing has been done to show whether *S. cratægella* is, or not, anything more than a local chalk form of *S. mercurella*; while the links that appear to bind *S. basistrigalis* to *S. ambigua* seem to strengthen every day. With a little united effort these questions might easily be settled next year, and the genus put in a thoroughly satisfactory condition.—C. A. BRIGGS; 55, Lincoln's Inn Fields, December 10, 1888.

SIREX JUVENCUS IN LONDON.—Might not the insect (Entom. xxi. 282), have come out of a telegraph pole, or some other imported pine timber? I found a very fine specimen in a plantation of mine here in 1881.—EDWARD R. DALE; Glanville's Wootton, Dorset, November 3, 1888.

LEPIDOPTERA IN SUSSEX.—I did but little during last season, on account of the very damp summer, which made collecting most unfavourable. With the first bright days of April examples of hibernated *Gonopteryx rhamni* and *Vanessidæ* were observed in plenty. The sawflies were well out by the middle of the month, but the only moths I took at them were the commoner *Tæniocampidæ*. *Euchloë cardamines* was unusually abundant towards the end of May, and about the same time I took *Anarta myrtili* on Ashdown Forest, and *Argynnis euphrosyne* was just beginning to emerge in large numbers. On June 7th I captured a magnificent *Vanessa cardui*, the first specimen I had seen at Groombridge since 1885; during the next few weeks I saw several others. Larvæ of *Bombyx neustria* were to be found in great numbers this month, as well as those of *Diloba cæruleocephala*, the latter generally occurring on laurel in the garden. Larvæ of *Dicranura vinula* in various stages of growth were plentiful on willow bushes. Towards the end of June I met with numerous specimens of *Arctia villica*, and *Zygæna filipendulæ* was to be seen flying in the sunshine in most places where the long grass was growing. *Tanagra atrata* (*chærophyllata*) also appeared in two localities. At the commencement of July, a long row of pinks in the garden proved very attractive; five *Sphinx ligustri*, one *Chærocampa elpenor*, and several smaller moths being taken in a very short time. About this time *Smerinthus ocellatus*, *S. populi*, *Bombyx rubi*, *Plusia chrysitis*, and *Angerona prunaria* occurred. On the 9th *Macroglossa fuciformis* was taken flying over hedge wound-wort (*Stachys sylvatica*), and *Acronycta megacephala*, also *Aplecta nebulosa* were found at rest. The larvæ of *Cucullia verbasci* were common on water-betony and mullein. *Nemeophila russula* occurred on Broadwater Common. On the evening of the 23rd I tried sugaring in a small wood, and as regards numbers had the most successful evening that I ever remember. It was very sultry, pitch-dark, and a few drops of rain were falling. Moths were in countless numbers on the trees, and I took *Leucania conigera*, *L. comma*, *L. pallens*, *Xylophasia lithoxylea*, *X. monoglypha*, *Dipterygia scabriuscula* (*pinastri*), *Miana bicoloria* (*furuncula*), *Apamea gemina*, *A. didyma*, *Agrotis exclamatoris*, *A. nigricans*, *Noctua triangulum*, *N. festiva*, and *Mania typica*. *Argynnis selene* was out in immense numbers on Broadwater Common about the middle of the month, as was *Bupalus piniaria*, among the pine trees. On August 3rd I noticed *Thecla quercus* in the village flying under an oak tree, and found a larva of *Saturnia pavonia* feeding on elderberry. *Charæa graminis* occurred at light at the

end of August. I was surprised to find large numbers of the larvæ of *V. urticae* about the second week in September, in all stages of growth, on nettles. Most of these turned to pupa about October 2nd, and emerged about the 15th of the same month. During this latter month, specimens of *D. cæruleocephala* were frequently taken at light.—W. H. BLABER; Sunnyside, Groombridge, Sussex, November 9, 1888.

NOTES FROM WIMBORNE.—Last season I collected above fifty larvæ of *Euchloë cardamines*, also several of *Pieris napi* and *P. rapæ*, all feeding upon common watercress in a damp ditch; nearly all have emerged, females of the first-named being far more numerous than males. I have bred a fine series of *Gonepteryx rhamni* from ova and larvæ; one specimen is curious, in colour it is intermediate between the sexes. The larvæ of *Macroglossa fuciformis* have been plentiful this year during July and August. I took above forty, in all stages. They were very easy to detect upon honeysuckle leaves; when young they perforate two or three holes near the midrib, and rest underneath. About thirty have changed. I find all are alive and free from parasites. On June 6th I caught a female *Colias edusa*; it is in excellent condition and does not look as if it had hibernated; the fringes are good. The following is a partial list of my captures here:—On a patch of heath about two acres in extent, *Hesperia malvæ*, *Nisoniades tages*, *Pamphila sylvanus* and *P. thaumas*, dark forms. *Cænonympha pamphilus*, very fine, a female with two perfect ocelli on the upper surface of both hind wings. *Polyommatus phlæas*, some with scarcely any spots at all. *Lycana ægon* very plentiful, from deep purple to light blue; one male with dark iridescent blotches upon the centre of the upper anterior wings. *L. icarus*, an isolated colony, about a dozen of which I netted, all the females, five in number, are more or less confluent, two especially so, whilst the males are of the ordinary type. *Thecla rubi*, *Saturnia carpini*, *Euthemonia russula*, several and two females, *Anarta myrtila*, *Fidonia piniaria* in swarms, the first being alive with them; I find the pupæ mostly in rotten wood under the trees. *Lithosia mesomella*, *Agrotis porphyrea* and others; although I found *Thecla rubi* and *Hesperia malvæ* common in the spring, I failed to find any in the autumn; the same with other double-brooded species. *Satyrus semele* common on fir-tree trunks, a position this insect usually rests upon, where bare rock or ground is absent. By beating, searching trees, &c., I collected the following:—*Eurymene dolabraria*, *Ourapteryx sambucata*, *Geometra papilionaria*, *Orgyia pudibunda*, *Chelonia villica*, *Arctia fuliginosa*, *Eltopia prosapiaria*, *Platypteryx hamula*, *P. falcataria*, *Macaria alternata*, *Pseudoterpna pruinata*, *Calligenia miniata*, *Acidalia emarginata*, &c. At sugar *Demas coryli*, *Thyatira derasa*, *T. batis*, *Acronycta psi*, *Xanthia fulvago*, *X. flavago*, and a fine series of *Acronycta ligustri*, from pale grey to almost black, one suffused with green. One *A. leporina*, dark grey, from a larva found upon willow. On September 27th I found a brood of *Vanessa urticae*, the last of which emerged to the imago on October 30th; although well fed they are small and dark, some red between the black spots instead of the usual yellow; one has only one spot and a faint dot in the middle of the forewings. *Psyche villosella* very plentiful upon heath; I took numbers of the larvæ in their cases during the spring, but quite six females emerged to one male. I put about a dozen cases (which I had cut open) containing female pupæ in a separate box, and upon opening it some time afterwards, there were hundreds of minute larvæ, some

with cases made of paper, &c. Knowing the eggs were unfertilised I destroyed the lot, supposing they would produce females only. I visited Brockenhurst occasionally during the last fortnight in July, and found eleven pupæ of *Vanessa polychloros*, nine from a shed under some elms, close by the station, and two in the station whilst waiting for the train, and a gentleman gave me six from a batch he discovered feeding upon sallow; eleven have emerged, but the elm-fed specimens are larger than the others. In the forest I netted one confluent male, an *Argynnis paphia*, four *valezina*, several *A. adippe*, and *Thecla quercus*, the latter resting upon ferns under young oak trees. In one of the ridings I saw a large dragon-fly dart at a male *paphia*; both fell to the ground, the latter was soon disabled. I have seen them attack flies, but never such big game before. — J. H. FOWLER; Leith Cottage, Grove Road, Wimborne, Dorset, November 8, 1888.

EARLY SEASON IN NEW ZEALAND. — After a cold and tempestuous summer, we have here experienced a remarkably fine winter and early spring. On Sept. 16th I was much surprised to come across several larvæ of *V. gonerilla*, who had passed their second moult and were feeding vigorously. From this it would seem probable that the "new" specimens are likely to appear as early as November 1st, which will be, according to my experience, at least two months before the usual time. I have not observed quite such a marked advancement in other insects, although the season seems to be a very early one. — G. V. HUDSON; Wellington, New Zealand, October 17, 1888.

ROCHEFORT IN AUGUST. — Rochefort is a small town in the Belgian highlands, built in a picturesque valley at the level of 400 meters above the sea. It is surrounded by woods of varied growth and affords every accommodation to tourists. There are two good hotels in the town, of which the "Hotel Biron" is the largest, and at which attention is paid to the wants of the entomologist. The geological formation of the neighbourhood is schist, overlaying a hard limestone with some marble. The limestone rocks often penetrate the schist, and form hills of a dark blue-black colour. Taking the Hotel Biron as a central point, excursions may be made in various directions. To the south stretches the Han road, which winds round the side of a hill and leads to the famous grottoes of that name. The road is overhung on one side by woods, which afford excellent hunting-ground. The woods belong to the commune and are free to anyone. To the west is the road to Dinan, which is very beautiful, and leads through the forest of Rochefort, as does also the Cigny road, which branches off from the Dinan road just beyond the town. This forest is also communal and therefore free. The trees composing the forest are very various in size and character, but most are small; the underwood is composed of nut-bushes and wild plum, with some broom. To the northward is the Jemelle road, from which a path branches off, leading down a deep gully between limestone hills. This gully teems with insects. Many Lepidoptera are common in all these localities; of these I give a list, so as not to refer to them again: — *Argynnis paphia*, *Vanessa io*, *V. atalanta*, *V. cardui*, *Erebia medea*, *Pararge egeria*, *P. megæra*, *Satyrus semele*, *Thecla betula*, *Lycæna corydon*, *Colias hyale*. *Plusia gamma* was so abundant as to become a nuisance on the Han road. On a bright sunny afternoon, this is a good locality, espe-

cially where tufts of *Valeriana officinalis* grow. An occasional *Vanessa antiopa* may be seen, majestically sailing down from the overhanging trees, or springing up in front of the too ardent naturalist, just far enough away for him to be unable to reach it. This species is said to be very common in the neighbourhood, but owing to the bad season they have been very scarce this year. Now and then a *Callimorpha hera* will fly across the road, the bright red of its wings making it a conspicuous object, or it may be taken on the valerian-heads in company with numberless *Vanessidæ* and *Theclæ*. A few *V. urticae* may also be seen with *Erebia æthiops*. In the more open spots *Gonepteryx rhamni* is common. The trees which border the road yield *Catocala nupta*, *Liparis dispar*, *L. monacha*, &c. In the woods above the Han road, which require to be worked in the afternoon, as no sun reaches them in the morning, yield *Vanessa c-album* and *E. æthiops*. In the evening many *Geometræ* may be found. On the summit of the hill above the wood there is an open patch of grassy ground where *Argynnis aglaia* may be caught, with *A. dia*, *E. hyperanthes*, *Cænonympha pamphilus*, *C. arcania*, *L. icarus*, *L. minima*, *P. thaumas*, and *P. comma*. On the right side of the Dinan road, just beyond the town, there is a range of bare hills leading to the convent of St. Remy and the famous marble quarries. Insects are scarce here, but the large *H. circe* may be caught in fair numbers, with an occasional *Papilio machaon*. In the forest of Rochefort there are few roads which make it difficult to work, but it abounds in flowers and insects. The Lepidoptera worthy of note are *V. antiopa*, *A. adippe*, with var., *chlorodippe*, *A. dia*, *E. æthiops*, *E. ianira*, *C. pamphilus*, *C. arcania*, *P. phlæas*, *L. medon*, *L. argiolus*, *L. dorilis*, *L. astrarche*, *Pieris napi*, *L. sinapis*, *G. rhamni*, *C. edusa*, *P. thaumas* and *P. comma*. Among the moths, *Macroglossa stellatarum* and *O. antiqua*. In a gully on the Jemelle road I caught *H. circe*, *V. polychloros*, *L. icarus* and var. *icarinus*, *L. bellargus*, *L. astrarche*, *L. dorylas*, *L. medea*, *C. edusa*, *G. rhamni*, *P. napi*, *P. brassicæ*, *P. rapæ*, *S. alceæ*, *S. alveus*, *N. tages*, *E. tithonus* and *H. comma*. A few *Acidalia ornata* were also caught, with larvæ of *Smerinthus ocellatus*, *Cossus ligniperda* and *D. vinula*. One night only I went out with a lantern to this gully, and obtained numerous *Pyrales* and other interesting moths, especially *Tortrices* and *Tineæ*, which were very common. Before closing, I must allude to the beautiful schist-coloured grasshopper, with pale blue under wings, which form so conspicuous a feature among the insects. Looking at the collection, one is struck with the very dark appearance of the insects generally, and especially with the deep colours of the *P. megæra* and *P. egeria*, which are very much darker and smaller than those which I captured a few years ago in the plains of Northern France, though the French specimens are not faded. This dark coloration is no doubt due to the altitude of the locality, and also perhaps somewhat to the dark colour of the rocks. The specimens of *E. medea* are less hairy-looking and brighter in colour than those which I obtained in Oban (Scotland). I feel sure that a visit to this locality would amply repay anyone who could spend a holiday there. August is a little too late, as many of my specimens are the worse for wear. Orthopterists and coleopterists especially will find Rochefort a rich collecting-ground.—E. W. CARLIER; Physiological Laboratory, Edinburgh University.

THE WET SEASON AND OCELLI. — According to Mr. de Nicéville (Entomol. Soc., Feb. 8th, 1885), the ocellated spots on the under sides of

certain Indian Satyridæ differ very markedly in the wet and dry seasons' broods, and are fully developed in such cases in the dry season only. It therefore becomes of especial interest to learn (Entom. 273) that Mr. J. E. Winkworth has taken during the past wet season in England, five examples of *Epinephela hyperanthes* in which the ocelli are almost suppressed, all of them in the same county—Berkshire. *E. hyperanthes* var. *arete*, and forms approaching thereto, are not of exceeding rarity in most years, but it will be of very great interest if we find, as Mr. Winkworth's note seems to indicate, that they have been especially abundant during the past season. It is therefore to be hoped that those who have knowledge of this matter will publish the same.—T. D. A. COCKERELL; West Cliff, Colorado, November 27, 1888.

ABNORMAL DEVELOPMENT.—One of the most remarkable cases of abnormal development I have ever met with, recently came under my notice. On November 16th I met with a larva of *Pieris rapæ* which had spun up previous to pupating. Wishing to renew my specimen of this species, I took it with the intention of preserving it, and placed it in a small tin box, which I always carry in my vest pocket. A few hours later I noticed it had pupated; replacing it in my pocket, I forgot it until Nov. 28th, then, upon opening the box and noticing that the pupa appeared to be dried up, I broke it in halves, and to my surprise found the perfectly developed imago inside. That this species should be developed in twelve days is not, I think, a very exceptional occurrence, but in this case the pupa was loose in a box in a pocket, carried not less than eight miles each day, and subjected to every motion of the body. It shows, I think, that a very slight elevation or depression of the temperature serves to advance or retard the development of insects.—W. T. PEARCE; 111, High Street, Gosport, December 11, 1888.

HYBERNATING LARVÆ.—Can any one tell me the best way of rearing hibernating larvæ? I have *Uropteryx sambucaria* feeding on ivy, which I am anxious to successfully rear.—HENRY A. HILL; 20, Fellows Road, Hampstead, N.W., November 7, 1888.

RETARDED EMERGENCE.—I had a curious instance of this the other day. A solitary pupa of *Dicranura vinula*, which remained over from larvæ taken in 1887, suddenly emerged on the 10th of November, and developed itself to its own satisfaction and my considerable surprise.—G. M. A. HEWETT; The College, Winchester.

CELERY-FLY.—My plants of celery have often been much injured by the larva of some insect burrowing in and destroying the leaves, in which it makes patches or blotches rather than galleries. The pest has been unusually abundant this year in my own and neighbouring gardens, the worst of its ravages being committed in September and October; so that in the latter month many rows of celery about here presented a withered and sickly appearance, with hardly a green leaf to be seen, the growth of the plant being altogether checked. I should be glad to know the order and name of the insect, and also whether any plan can be recommended for getting rid of it. I have picked up a number of the pupæ, specimens of which I should be happy to forward to anyone who is interested in its natural history.—(Rev.) G. A. SMALLWOOD; Willington, Burton-on-Trent, November 10, 1888. [The history and a figure of the Celery-fly (*Teplritis*

onopordinis), with notes on prevention and remedy, is given in Miss E. A. Ormerod's 'Manual of Injurious Insects,' pp. 58-61.—E. A. F.]

PHYTOMYZA CHEROPHYLLI.—The autumn generation of this mining dipteron has occurred with us abundantly in the leaves of *Cherophyllum temulum* and *C. sylvestre* during September and October. The mine is most abundant in *C. temulum*, though it occurs, but far more sparingly, in *C. anthriscus* and *C. sylvestre*, as noticed first by Kaltenbach in 1872. The larva first makes a somewhat serpentine tunnel in an upper segment of the leaf-divisions, which it afterwards enlarges till the pulp is nearly all consumed, and a conspicuously white patch is all that is left to tell of its earlier life. The larva mostly pupates in the soil below, occasionally even in the mine itself. The tiny pupa is black and glossy, and the fly will doubtless put on wings in the spring of next year.—PETER INCHBALD; Hornsea, Holderness, December 19, 1888.

MOULD.—Can any reader of the 'Entomologist' suggest a remedy for the prevention of mould? Several specimens in my drawers are slightly affected. One time my cabinet did not occupy one of the driest situations. I have cleaned the few specimens that were affected by means of a camel-hair brush. Is mould contagious, and are the same specimens likely to be subjected to it again? A prevention was given some years ago by the Rev. J. Tasker (Entom. xv. 233), but from the experience of Mr. H. Dobson, jun. (Entom. xv. 234), it was injurious to the white insects, turning them a dirty cream colour; by so doing the remedy becomes equal to the disease.—THOMAS WALPOLE; 9, Dudley Terrace, New Somerby, Grantham. [Calvert's glacial carbolic acid should be placed on a small piece of cotton-wool on the head of a pin, about the centre of the affected drawer. This will destroy all life, either vegetable or animal, in the drawer, which should be kept tightly closed for a few days. Mould is a fungoid growth which spreads or returns wherever the spores find a suitable nidus to commence a further colony.—J. T. C.]

ERRATUM.—Entom. xxi. p. 316, line 7, for *Syrichthus malvæ (alveolus)* read *Hesperia sylvanus*.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—December 5th, 1888.—Dr. D. Sharp, F.L.S., President, in the chair. Mr. B. A. Bower, of Eltham, Kent, was elected a Fellow of the Society. Mr. W. F. Kirby exhibited, for the Rev. Dr. Walker, a variety of the female of *Ornithoptera brookiana*; he also exhibited, for Major Partridge, an undetermined species of the genus *Hadena*, captured last summer in the Isle of Portland. Mr. R. South exhibited a series of specimens of *Tortrix piceana*, L., from a pine wood in Surrey; also melanic forms of *Tortrix podana*, S., from St. John's Wood. Prof. Meldola exhibited, for Dr. Laver, a melanic specimen of *Catocala nupta*, taken last September at Colchester. Mr. E. B. Poulton exhibited preserved larvæ of *Sphinx convolvuli*, showing the extreme dark and light forms of the species. Mr. M'Lachlan called attention to a plate, representing species of the genus *Agrotis*, executed by photography, illustrating a memoir by Dr. Max Standfuss, in the Correspondenz-Blatt, Verein 'Iris,' in Dresden, 1888. He considered it was the best example of photography as adapted for entomological purposes he had ever seen,

especially as regarded its stereoscopic effect. The Rev. Canon Fowler exhibited a specimen of *Mycterus curculionoides*, sent to him by Mr. Olliff, and taken by Mr. Gunning near Oxford about 1882. Mr. W. Nicholson exhibited several melanic varieties of *Argynnis niobe* and *A. pales*, collected by himself last summer in the Engadine. Mr. J. H. Leech exhibited a small collection of Lepidoptera formed last year by Mr. Pratt at Kiukiang, Central China. It included several new species, also specimens of a variety of *Papilio sarpedon* and other interesting forms. Mons. A. Wailly exhibited a collection of Lepidoptera lately received from Assam, containing upwards of thirty-five species of *Papilio*, *Ornithoptera*, *Charaxes*, *Diadema*, *Cyrestis*, and other genera. Mr. Meyer-Darcis exhibited specimens of *Sternocera tricolor*, Kerr, and *S. variabilis*, Kerr, from Lake Tanganyika; also two new species of *Julodis* from Syria. Mr. F. Merrifield exhibited, and made remarks on, a long series of *Selene illustraria*, *S. illunaria*, and *E. alniaria*, in illustration of his paper on "Pedigree Moth-breeding." Lord Walsingham exhibited and made remarks on, a series of species representing the genera *Snellenia*, Wlsm., *Edematopoda*, Z., and *Eretmocera*, Z. The Rev. T. A. Marshall communicated a paper entitled "A Monograph of British *Braconidæ*. Part III." The Rev. Dr. Walker communicated a paper entitled "Description of a variety of the female of *Ornithoptera Brookiana*." Lord Walsingham read a paper entitled "A Monograph of the genera connecting *Tinægeria*, Wlk., with *Eretmocera*, Z." A discussion ensued, in which Mr. Stainton, Dr. Sharp, and others took part. Mr. Merrifield read a paper entitled "Incidental Observations in Pedigree Moth-breeding." This paper contained a detailed account of experiments with *Selene illustraria*, *S. illunaria*, and *E. alniaria*, which, so far as they had yet proceeded, indicated that retardation of development in the growing stages of the larvæ, as well as in the pupal stage, was the cause of the darkening of colour in the perfect insects; that a low temperature had the effect of causing such retardation; and that growing the larvæ at a forcing temperature tended to produce a warmer and yellower tint in the colouring of the moths. Lord Walsingham, Mr. Poulton, Prof. Meldola, Mr. White, and Mr. Merrifield took part in the discussion which ensued. Mr. J. H. Leech read a paper "On a small collection of Lepidoptera from Kiukiang." Captain Elwes said he had examined this collection with very great interest, and was struck with the similarity of many of the species to those from Sikkim.—H. Goss and W. W. Fowler, *Hon. Secretaries*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. —November 22nd, 1888. John T. Carrington, Vice-President, in the chair. Messrs. W. G. Dawson, F. E. Brown, A. Marshall, and J. Katy were elected members. Mr. J. Jäger exhibited *Agrotis præcox* from Glamorganshire, obtained by shaking the sand-crests; dark forms of *Acidalia marginipunctatata* from S. Wales, *Cidaria reticulata* from the Lake District, and *Lobophora viretata* from Staffordshire. Mr. E. B. Nevinson, *Leucania putrescens*, S. Wales; *Acontia luctuosa*, Surrey; two dark forms of *Heliothis peltigera*, one taken on the 15th, and the larva of the other on the 18th, August, which produced an imago on the 17th September. Mr. R. Adkin, *Pieris napi* from West Ireland, approaching var. *bryonia*, Hb.; *Ellopia prosapiaria* from English and Irish localities; *Ematurga atomaria*, *Larentia didymata*, *Eupithecia nanata*, and *Hypsipetes sordidata* from English, Irish,



and Scotch localities. Mr. Tugwell, two specimens of *Margarodes unionalis*, taken, 1877, at Kingsdown, Kent, off flowers of *Eupatorium cannabinum*; two examples of *Mecyna polygonalis*, both taken in 1877,—one at Deal and the other at Kingsdown; a series of *Eupithecia extensaria* from King's Lynn; and *Acidalia immorata* from Lewes, and made some observations upon his exhibit. Mr. Henderson, examples of the second brood of *Tephrosia crepuscularia* from Oxfordshire. Mr. Hawes, ova of *Bombyx neustria*, clustered round the stalk of a plum. Mr. West (Streatham), *Polia chi* from N. Wales.

December 13th, 1888. T. R. Billups, President, in the chair. Messrs. G. Tindall and M. Winkley were elected members. Mr. Frohawk exhibited the specimen of *Vanessa antiopa*, taken by him at Chatham, together with German and American examples of the species. Mr. R. Adkin, on behalf of Mr. Austin, a pale fawn-coloured var. of *Epinephele ianira*, a strongly-marked example of *Canonympha pamphilus*, blue forms of the male and female of *Lycæna bellargus*, and the under side of the male with dark grey ground colour and the usual spots absent; also pale, xanthic, and grey forms of *Bryophila perla*, all taken at Folkestone. Mr. Carrington, a strongly-marked var. of *Vanessa c-album*, taken near Droitwich. Mr. Adye, unusually large and small forms of *Selenia tetralunaria* and *Metrocampa margaritaria*. Mr. J. T. Williams, *Acidalia immorata*, Lewes; *Deiopeia pulchella* from Southbourne, 1876; and *Cymatophora* or from the Hebrides. Mr. Helps, *Ptilophora plumigera*, bred. Mr. R. South, British and foreign examples of *Dianthæcia* allied to *D. nana*, and contributed notes thereon; a discussion ensued, Messrs. South, Carrington, Gregson, Tugwell, and others taking part. Mr. R. Adkin exhibited series of *D. nana* from Kent, Surrey, Shetland, and the Hebrides; and Mr. Hall, series of many species of *Dianthæcia*. Mr. South also exhibited a form of *Gortyna ochracea* from Perthshire, and made some observations thereon. Mr. W. H. Tugwell, forms of *Hypsipetes sordidata*, bred from larvæ obtained from Huddersfield; *Agrotis simulans*, Aberdeenshire; and *Nemeophila plantaginis*, var. *hospita*, from Forfarshire. Mr. Manger, *Dynastes hercules*, Fab., from Montserrat, *Chalcosoma atlas*, Fab., *Megalosoma thesus*, Fab., and a species of *golofa*, which was not identified,—all from Brazil. Mr. Billups, fifty species of *Chrysomelidæ*, from various parts of the world; also some specimens of *Miaris micros*, taken by Mr. West in Headley Lane, by sweeping, in the year 1884. Mr. West said that when he took this species it was extremely abundant, but he had not been able to find it since. Mr. Billups also exhibited *Hotinus clavatus*, Westw., taken by Mr. Elwes at Darjeeling, 1886.—H. W. BARKER, Hon. Sec.

AN ENTOMOLOGICAL SOCIETY FOR BIRMINGHAM.—A preliminary meeting of some of the Birmingham entomologists was held, on December 13th, to discuss the formation of a local Entomological Society. The chairman, Mr. W. G. Blatch, made some remarks indicating the lines upon which he considered such a Society should work; and, after considerable discussion, it was unanimously agreed that such a Society should be started, to be called the Birmingham Entomological Society. Mr. W. G. Blatch was elected President; and Mr. Colbran J. Wainwright, of Hall Road, Handsworth, Birmingham, Hon. Secretary, from whom particulars may be obtained. A second meeting will shortly be held to draft a constitution and rules, and settle all necessary preliminaries.





H. Knight ad nat.

The Genus *Luehdorfia*.

West, Newman & Co chromo.

THE ENTOMOLOGIST.

VOL. XXII.]

FEBRUARY, 1889.

[No. 309.]

DESCRIPTION OF A NEW *LUEHDORFIA* FROM JAPAN.

By J. H. LEECH, B.A., F.L.S., &c.

(PLATE I., FIG. 1.)

LUEHDORFIA JAPONICA, nov. sp.

Expanse, 70 mm. Primaries pale yellow, black at base and external margin, with three transverse oblique black bands on the disc, and one parallel with outer margin, with which the third oblique band is united below the middle; a black dash from the costa between first and second and second and third oblique bands. Secondaries pale yellow, with a broad black band along the inner margin, and another, oblique and interrupted, on the disc beyond which is a black costal dash: the outer third black, enclosing five blue spots, and edged externally with some orange patches; a conspicuous crimson blotch above anal angle. Fringes chequered black and white. Under surface as above, but the crimson colour assumes a band-like form, traversing the wing parallel with outer margin from anal angle to second subcostal nervule; the orange on outer margin also forms a complete band.

This species was erroneously referred to as *L. puziloi* by Mr. Pryer in his catalogue of 'Lepidoptera of Japan,' and subsequently by myself in my paper on the "Lepidoptera of Japan and Corea," P. Z. S., 1887, when I did not possess specimens of the species. I at first considered it to be merely a local form of *L. puziloi*, but the following characters are amply sufficient to separate it from that species. In the first place the "pouch" of female of *L. japonica* is without a keel, and is black instead of light chestnut; this, without reference to other points of difference, at once distinguishes it; but it is further much larger in size, the ground colour is darker, and the anal blotch is broader and of a bright crimson.

With regard to the pouch of *L. puziloi*, M. Oberthür is of opinion that this is probably not developed until pairing has

taken place. If this is so, it may account for some of the females, both of *puziloi* and *japonica*, being without this appendage.

Recorded from Yesso and the Kurile Islands. There were several specimens in Pryer's collection, which has lately come into my possession. These were taken at Gifu in April, and are probably the examples referred to (E. M. M. xxiv. 66). I also have one example which was taken by my native collector at Bungo, Isle of Kiushiu.

Luehdorfia puziloi has been recorded from Eastern Siberia, Vladivostok, and Isle of Askold.

EXPLANATION OF PLATE I.

Luehdorfia japonica, Leech.—Fig. 1, ♀. Fig. 1a, ♀, under surface; fig. 1b, ♀, pouch, full view; fig. 1c, ♀, pouch, side view.

Luehdorfia puziloi, Erschoff.—Fig. 2, ♀. Fig. 2a, ♀, under surface; fig. 2b, ♀, pouch, full view; fig. 2c, ♀, pouch, side view.

ON THE VARIATION OF INSECTS.

By T. D. A. COCKERELL.

(Continued from p. 6.)

h. The so-called hermaphrodites.

Colias edusa, Entom. xi. 101. *Lycæna icarus*, Entom. xi. 101, 209; xx. 302. *L. ægon*, Entom. xi. 101. *Clostera curtula*, Entom. xi. 103. *Epione vespertaria*, Entom. xi. 104. *Satyrus semele*, Newman, Brit. Butt. 89. *Odonestis potatoria*, Entom. xvi. 188. *Lasiocampa trifolii*, Ent. Mo. Mag. 1882, iii. *Anthocharis cardamines*, Entom. xii. 181 (♂).—In these examples part of the insect has the superficial characters of the male, and part of the female, in a similar manner to the forms quoted under "g." That they are not true hermaphrodites is clear enough, and it is highly probable from analogy that the primary sexual organs are aborted, though I am not at present aware of any positive evidence that this is the case. Having in view the fact that in cases of female dimorphism specimens combining the two forms may occur, and further, that the secondary sexual characters of female Lepidoptera have probably arisen in dimorphisms (see under "f"), it seems possible that these examples are cases of partial reversion, tokens that the female was once dimorphic.

i. One sex assuming the superficial characters of the other.

Biston hirtaria, ♂, with ♀ colouring, Entom. xi. 102. *Epione vespertaria*, ♂, with ♀ colouring, Entom. xi. 170, and coloured fig. *Colias edusa pseudomas*, ♀ without yellow spots on black marginal bands, Entom. xi. *Epinephele ianira pseudomas*, Newman, Brit. Butt. 92. *Aphycus ceroplastis pseudomas*,

Howard, in describing this Chalcid from New Mexico, mentions that four females had a black shade in the middle of the mesocutum, and black instead of yellow axillæ, thus resembling the normal ♂ of the species.—Following the line of argument under “h,” these will appear as examples of reversion to the primitive type, which has been maintained typically in one sex, but lost in the other. From the facts recorded by Mr. J. Bland Sutton, concerning a female golden-pheasant which took the plumage of the male, and his comments thereon, it would appear probable that the immediate cause of this reversion to the supposed primitive type is the abortion of the organs of generation. In many species of vertebrata the young of one sex resemble closely the adult of the other in superficial characters; it may be that some Lepidoptera pass through a primitive stage, which characterises the adult of the opposite sex, in the pupa, and the sexual organs being occasionally aborted at this critical moment, the secondary sexual characters do not further develop, resulting in a specimen such as those referred to above. It would, therefore, be of the highest interest if any future captor of such a specimen would dissect it while fresh, and examine the condition of the reproductive organs.

k. Seasonal forms.

Papilio ajax, spring form *telamonides*, Feld., and summer form *marcellus*, Bd. *Pieris protodice*, spring form *vernalis*, Edw., is smaller and darker than the summer form. *P. oleracea*, summer form often larger, and wings thinner and purer white than spring form. *P. rapæ*, “Farther south (in the United States) the winter (spring) form tends to pure white on the upper surface” (G. H. French). *Colias eurytheme*, spring form *keewaydin*, Edw., smaller than summer form, duller yellow and with less roseate reflection, both sides more sprinkled with black scales, the orange patch on the fore wings not so marked, sometimes almost absent. *Phyciodes tharos*, seasonal forms *marcia*, Edw., and *morpheus*, Fb.; *P. phaon* also has seasonal forms. *Grapta interrogationis*, hybernating form *fabricii*, Edw., summer form *umbrosa*, Lintn.; “There are about four broods in a season, and while those of the last or hybernating brood are the pale forms, the others are more or less mixed, as Mr. Edwards has shown” (G. H. French). *G. comma*, hybernating form *harrisii*, Edw., summer form *dryas*, Edw. *Lycena pseudargiolus* vars. *lucia*, Kirby, and *marginata*, Edw., coming from pupæ which have hybernated, show coalescence of markings on the under side of the hind wings. *Selenia bilunaria juliana*, Haw., and *S. lunaria delunaria*, Hb.—In North America, owing to the great difference between the summer and winter climates, seasonal forms are often very marked. As a rule, the spring form, emerging from pupæ which have hybernated, is smaller

and darker than the summer brood, a condition which has been attributed to the effects of cold while in the pupa stage. But, strangely enough, a moderate amount of cold appears to have an opposite effect, for in our climate the spring Pieridæ, which are dark in America, are distinctly lighter than the summer forms, and the imported *P. rapæ* would seem to have retained that character somewhat in America. Also, as regards size, I believe that it is found that the races of large silk-moths, which are bred on the cooler slopes of the Himalayas, are invariably larger and finer than those of the same species from the heated plains of India; and this has been attributed to their longer sojourn in the pupal state, whereby they have more time for development. The only theory I can advance to harmonise these various facts may seem to many a somewhat unwarranted one, and I shall look with interest for any comments on it. The darker and smaller forms may be supposed always to be those whose development has been quick, the metabolism great in proportion to the growth, while the larger and lighter forms have developed more slowly, with a longer period of growth, and less intense metabolism; in short, as Mr. P. Geddes would say, the first have developed katabolically, the last anabolically. When eggs or seeds are subjected to a low temperature, although life is not necessarily extinguished, growth and metabolism cease. The winter in North America is sufficiently cold to have a like effect upon hybernating pupæ,—they live, but do not grow. The summer comes on with comparative suddenness, and the hot rays of the sun throw them into the most intense metabolism, so that the imago emerges with the wing-structures, so far from having developed slowly and in the cold, presenting every evidence of rapid change. In a climate like that of England, however, the winter is not cold enough to entirely arrest wing-growth, and hence the spring emergences present usually some evidence of slow change accompanied by gradual growth. It will probably be objected to the above theory, that summer in America is at least as hot as spring, so why do not the summer forms present at least as much evidence of quick change? To which I can only reply, that I am inclined to suppose that the vital structures and organs of generation develop at a much lower temperature than the wings, of which theory confirmation will be seen in such examples as the normally wingless, but otherwise perfect, *Choreius ineptus*, which is said often to develop wings in unusually hot seasons. I hold, therefore, that the North American species hybernating in the pupal state attain a nearly perfect development of their vital functions before the spring, although wing-growth has been in abeyance; but those pupating and emerging in the summer cannot assume the perfect state until the time necessary for the growth of the vital and repro-

ductive organs has expired, so that the wings, developing all the while, have no period of sudden quick change like those of the spring brood. The seasons in Europe were probably at one time much more marked, and possibly some of the Mediterranean species arose as summer forms of northern species, or *vice versâ*: for instance, in the genus *Gonopteryx*. *Colias eurytheme*, of North America, has in the summer brood an orange patch on the fore wings similar to that of *Gonopteryx cleopatra*, but the spring emergence has the patch much reduced, and sometimes almost absent, thus resembling *G. rhamni*. Now, supposing the climate were to become more uniformly cold in the north and warm in the south, these seasonal forms would be transformed into geographical races, and ultimately species. Such may have been the origin of *G. rhamni* and *cleopatra*.

(To be continued.)

CONTRIBUTIONS TO THE HISTORY OF THE BRITISH PTEROPHORI.

BY RICHARD SOUTH, F.E.S.

(Concluded from vol. xviii., p. 282.)

As it appears inexpedient to wait until I have found or otherwise obtained all the larvæ of plume-moths I still require for figuring and describing, I venture to complete the imago descriptions of British Pterophoridae, and, at the same time, append descriptions of such larvæ and pupæ as I have met with since my last contribution. Some of these larval descriptions have already been published, in 'British Pyralides,' by Mr. J. H. Leech. As it may interest those who study the Pterophoridae, I may add that coloured figures of all our species are given in the work referred to.

Before proceeding with the descriptions, I have a few observations to make respecting some of the species noticed in previous papers.

Platyptilia zetterstedti.

In a former note (Entom. xviii. 172) I remarked that the insect we knew as *zetterstedti* was not Zeller's species of that name, and I further questioned the occurrence of *zetterstedti*, Zell., in this country. In this, however, I think I was partly wrong. I have received other examples of so-called *zetterstedti* from the Continent; the latest additions are from Dr. Staudinger, and all are most certainly referable to *P. gonodactyla*. Now, therefore, it follows that unless Zeller's species is a scarce insect, with which continental entomologists of repute are not well acquainted, and the examples sent me from various sources were all wrongly named, *zetterstedti*, Zell., sinks as a synonym of

gonodactyla, whilst our insect is without a name. I do not, however, propose to invent a new one for it; why, will presently appear; and for the present it will be convenient to refer to it by the name it has borne so long in this country. Among the *zetterstedti* which I took in North Devon is one example, which at the time I thought, from its greater size and more pronounced markings, must be a distinct species. It was figured as probably *P. nemoralis*, Entom. xiv., Pl. I., fig. 19, but I subsequently determined it to be an exaggerated form of *zetterstedti*, believing, as I then did, that that insect was a distinct species. Comparing this *nemoralis*-like specimen again with a more varied series of *P. nemoralis* from the Continent, I cannot now see that there is any material difference between them. The N. Devon insect is perhaps somewhat smaller in size and a little paler in colour than *nemoralis*, but it agrees quite as well with that species as it does with *zetterstedti*, so that, unless it be distinct from either (which I cannot suppose it is), it must be considered an intermediate form, and as such it admirably serves to connect our *zetterstedti* with continental *nemoralis*. The larva of *nemoralis* is said to feed on *Senecio memorensis*; so also, it is stated, does that of *zetterstedti*; therefore it may be that a form of *nemoralis* occurs on the Continent similar to our *zetterstedti*, and that it is this form which is the type of Zeller's species. In the interests of synonymy and exact nomenclature, it will of course be desirable to ascertain which of the insects we know as *zetterstedti* and *gonodactyla* agrees best with Zeller's type of *zetterstedti*. This at the moment, however, I cannot do, but hope to be able to satisfy myself on the point before long; any way, the result of such enquiry cannot affect the conclusion at which I have arrived touching the identity of our *zetterstedti* and *P. nemoralis*, Zell.

Amblyptilia teniadactyla.

As stated by Mr. Leech ('Brit. Pyralides,' p. 54), my *teniadactyla* is a variety of our *zetterstedti*. Among a score of the last-named insect, sent me by Mr. Purdy, of Folkestone, were the form I had described and other intermediate forms.

Platyptilia farfarella, Zell. Stett. Ent. Zeit., 1867, p. 334.

IMAGO.—Expanse, 9–10 lines. Fore wing dingy brown, more or less suffused with ochreous; costal triangle, whitish submarginal line, and fringes exactly as in *gonodactyla*, as also are the hind wings.

This insect is probably only a form of *P. gonodactyla*, but not, as I have supposed, peculiar to the second brood of that species. I have several continental specimens, and they are certainly smaller and darker than the usual form of *gonodactyla*, but, as a whole, they are not darker than some of my *gonodactyla*, lighter than other specimens of that species in my collection.

In fact, one example, bred from a pupa obtained at Southend, is smaller than either of the *farfarella*. In a most interesting account of sundry excursions in Prussian Posen (Ent. Mo. Mag. vi. 48), Prof. Zeller says: "I . . . started from the edge of the ditch a *Platyptilia*, which appears very like *gonodactylus*, but is strikingly smaller, and therefore deserves a close examination, especially since I have found specimens precisely similar in other places. I immediately suspected that there must be *Tussilago* in the neighbourhood, and truly found, on making a more accurate investigation, that a short distance from the spot were a few plants of *Tussilago farfara*, which had established itself here, and which had previously escaped my notice." In a subsequent life-history of *farfarella* by Zeller (Stett. Ent. Zeit., 1870, pp. 310-315), the larva is said to feed in the root-crown and flower-stalks of *Senecio vernalis*; but it has also been stated to feed on the under side of colt's-foot leaves.

Platyptilia isodactyla, Zell.

IMAGO.—Expanse, 10-12 lines. Fore wing: ground colour pale ochreous-brown, with a greyish discal suffusion, and some ill-defined dark brown markings, one of which is a blotch, more or less triangular in shape, situate on the costa; the hind margin is broadly banded with dark grey-brown, margined internally with a line of pale ochreous brown, a black spot at the apex of costal triangle, near the digital juncture; fringes pale grey; tip of outer digit slightly pointed. Hind wing: grey-brown, fringes paler at the base, and with some black scales about the inner margin of third feather, but not forming a distinct tuft, as in *P. gonodactyla* (*trigonodactylus*). Head and thorax colour of fore wings; abdominal junctions paler.

Mr. Barrett says there are two broods of this insect,—one is on the wing in June, and the other in August and September. A description of the larva and pupa, by the late Mr. Buckler, will be found in Ent. Mo. Mag. viii. 154.

Amblyptilia acanthodactyla, Hübn.

cosmodactyla, Hübn.

punctidactylus, Haw.

IMAGO.—Expanse, 8-11 lines. Fore wing dark grey-brown, with a reddish suffusion, a small dark spot on the inner margin between the base and middle of wing, a dark spot about the middle of costa, followed by a blackish costal triangle, a broad blackish fascia traversing both digits, bordered externally by a narrow whitish line, and internally on the outer digit only by an ochreous cloud; fringes whitish, with a tuft of black scales on the middle of inner margin, and a smaller one between this and outer angle; the internal fringes of outer digit are tinged with fuscous. Hind wing dark grey-brown; fringes grey-brown; third feather with a tuft of black scales on its inner margin. Head and thorax colour of fore wings; abdominal junction white. May, June, August, September.

Var. *α*.—Fore wing ochreous grey, with a rosy tinge; markings as in the type, but more clearly defined and with oblique striæ, similar to the same character in *cosmodactyla*, but not so conspicuous. September.

Var. β .—Ground colour of fore wing pale olive-brown spotted with grey, and with oblique grey-brown striæ, in addition to the typical markings. This is known as *cosmodactyla*. July, August, September.

LARVA.—Length, 6-7 lines, when full grown. Ground colour dark green, with the dorsal vessel showing darker. Head pale olive-green, freckled with blackish along the crown and cheeks: mandibles reddish brown. Along the dorsal area are four whitish warts on each segment, from each of which two bristles of unequal length are emitted; subdorsal, two warts on each segment, the anterior of which has two whitish hairs, and the posterior one short hair or bristle; spiracular one dark green wart on each segment, emitting two short whitish bristles. The dorsal and subdorsal series of tubercles are placed on linear yellowish patches; minute blackish bristles are scattered over the entire dorsal and lateral areas. Prolegs blackish; anal claspers semitransparent, with a greenish tinge. August and September. Said to feed on various kinds of plants, but I have only bred the insect from larvæ found on *Stachys* and a garden variety of geranium.

PUPA.—At first of a greenish colour, changing subsequently to an obscure reddish brown; the antenna cases are detached from the abdomen, and there are two conspicuous thorn-like projections on the back. Head truncate. Attached by the tail near a flower-whorl of its food-plant (*Stachys sylvatica*). August and September.

The foregoing descriptions apply to the larva and pupa of var. α , which is probably identical with *stachydalis*, Frey. (Stett. Ent. Zeit., 1871, p. 125). I found larvæ, as well as pupæ and imagines, in a shady corner of Pelham Woods, Ventnor, on the 1st of September, 1883. A specimen of *A. acanthodactyla* from Ireland, which Mr. Percy Russ, of Sligo, was good enough to send me, has reddish brown fore wings, and is the only example I have yet seen of this coloration. Mr. Porritt, who has described the larva of *cosmodactyla* and also that of *acanthodactyla* (Ent. Mo. Mag. xxiii. 133), says that the chief points of distinction between them "are the deep purple ground colour in *acanthodactylus* as compared with the 'purplish pink' of *cosmodactylus*," the white subdorsal lines less conspicuous in *acanthodactyla*, and the head of the latter yellowish brown marked with black, instead of "very dark sienna-brown," as in *cosmodactyla*. I think much value cannot be attached to such very trivial points of difference. I have taken typical *acanthodactyla* at the end of May, but whether these were hibernated specimens or not I cannot positively say, but should suppose that they were. I have only bred the species in September.

Oxyptilus distans, Zell.

var. *letus*, Zell.

IMAGO.—Expanse, 8-9 lines. Fore wing pale brown, with a small black linear spot and whitish longitudinal dash on the disc, a whitish crescent at the digital junction, and a rather broad whitish band traversing both digits, followed by a narrower whitish band clearly defined on the outer digit; fringes dark brown, variegated with white at the extremities of

the bands. Hind wing golden brown; fringes of third feather whitish at base, and with a tuft of black scales just beyond the middle. June and July.

On the Continent the larva of *lætus* has been found on *Andryala sinuata*, one of the Compositæ, but not a British plant. Dr. Jordan suggests that probably the larva might be found on some species of *Hieracium* in this country. The *Oxyptilus*, occurring at Folkestone and in North Devon, is identical with *lætus*, and I have considered it to be distinct from *distans* (Entom. xv. 35), but examination of an extensive series of *O. distans* has convinced me that I was wrong in my conclusion. The points of difference I relied on will not hold, and *lætus* must sink as a species.

Oxyptilus pilosellæ, Zell.

IMAGO.—Expanse, 8–10 lines. Fore wing ochreous-brown clouded with darker, an ill-defined whitish fascia traverses the outer digit, but is scarcely traceable on the inner digit, beyond this is a whitish line crossing both digits, the enclosed area appearing darker than rest of wing; costa from line to apex with some white cilia; fringes brown, variegated with whitish along the inner margin, at external margin of inner digit, and edges of digital junction. Hind wing dark brown; fringes slightly paler; third feather with some black scales on each side of the shaft near the tip.

Oxyptilus hieracii, Zell.

IMAGO.—Expanse, 8–11 lines. Fore wing dark brown, a white fascia traverses the outer digit, but is not distinctly traceable on inner digit, beyond this is a whitish line crossing both digits; fringes brown, variegated with white or whitish along inner margin, at external margin of inner digit, and edges of digital juncture; costa from line to apex with some pale yellowish cilia. Hind wing dark brown; fringes slightly paler, with a prominent tuft of black scales near tip of third feather, occupying both sides of the shaft.

The foregoing description of *O. hieracii* and also that of *O. pilosellæ* are taken from continental specimens obtained from Dr. Staudinger. I am quite unable to refer to any character by which the one may be separated from the other. *Hieracii* is a darker insect, and the markings are consequently better defined; in other respects it does not appear to materially differ from *pilosellæ*, and I cannot consider it to be specifically distinct therefrom. I have no British example of either insect. Specimens of *O. teucii* have sometimes been sent me as *hieracii*, and large examples of *O. parvidactylus* for *pilosellæ*. *Teucii* may be readily known by the additional black spot at the tip of third feather, separated from the usual tuft of black scales by some white cilia. *O. parvidactylus* has the patch of black scales covering the tip of third feather, whilst in both *hieracii* and *teucii* the black scales are before the tip, and in *distans* nearer the middle than tip of third feather.

Oryptilus tenebris.

Dr. Mason, who has lately acquired the type of Haworth's *hetrodactylus*, finds that the specimen is identical with *tenebris*, Greening. This name, therefore, must sink in favour of the much earlier one of Haworth's (*vide* Ent. Mo. Mag. xxv. 162).

Oryptilus parvidactylus, Haw.
obscurus, Zell.

Imago.—Expanse, 6½–7½ lines. Fore wings dark brown, with some white scales at digital juncture, and two whitish fasciæ traversing both digits, but not always well-defined on the inner digit; fringes dark brown, variegated with white, and two small tufts of black scales along inner margin; also with white on the costa at apex, and at the angle of inner digit. Hind wing dark shining brown; third feather with some whitish scales along its inner margin, and a large patch of black scales covering the tip. May and June.

"The larva feeds in April on the young leaves of *Stachys alpina*; in autumn in the heads of *Marrubium*."

"The ground colour of the larva is dirty pale green; on each segment are four black warts, bearing a star-shaped tuft of bristles; head and dorsal pale black, the latter divided by a pale line. Frey."—Leech, 'British Pyralides,' p. 58.

Mimaseoptilus bipunctidactylus, Haw.
var. *plagiodyctylus*, Stainton.
var. *aridus*, Doubleday Cat.
var. *scabiodactylus*, Gregson.

A description of the imago and life-history of this species is given by me (Entom. xviii. 273), under the name of *M. plagiodyctylus*. I have a very extensive series of bred and captured specimens of the species, obtained in various British localities. The variation is considerable, and embraces not only the *plagiodyctylus* form, but also the pale ochreous var. *aridus*, and the strongly-marked variety first introduced by Mr. Gregson under the name of *scabiodactylus*. These various forms are so closely linked one with the other by intermediates that they must be considered simply varieties of the same species. Some of the forms, indeed, I cannot separate from continental *Mimaseoptili* in my collection, sent me as *M. pelidnodactylus* and *M. coprodactylus*. I am inclined to think that there must be some mistake about the larva of *bipunctidactylus* feeding on *Galium*. I have often disturbed numbers of the imagines from hedges bordering pasture-fields, but have not been able to obtain larvæ from the *Galium* growing in profusion in those hedges. Scabious there is in the pastures, and no doubt the larvæ of *bipunctidactylus* feed thereon, the imagines resorting to the herbage of the hedges for shelter.

Mimæseoptilus zophodactylus, Dup.
loewii, Zell.

IMAGO.—Expanse, 9–10 lines. Fore wing pale grey-brown, slightly tinged with violet and dotted with black scales, a black dot on disc of wing, and another at the lower edge of digital juncture; at the base of the grey-brown fringes are four small black dots, two of which are placed at angle of outer digit, and two near tip of inner digit; costa towards apex whitish, sometimes the entire costa is edged with whitish. Hind wing dark grey-brown. August.

LARVA.—Length, 5 lines, tapering towards anal extremity. Head shining yellowish green, smaller than 2nd segment. Ground colour yellowish green, with a broadish violet dorsal stripe from the 3rd to the 13th segments inclusive; there are numerous short pale grey hairs arranged in four lines along the dorsal and lateral areas, but no well-defined tubercles. Spiracles dark brown. September, in the flowers of *Erythraea centaureum*.

The foregoing description of the larva of *M. zophodactylus* has been already published in Mr. Leech's 'British Pyralides.' Lafaury records larva of *M. zophodactylus* on *Chlora perfoliata*, and suggests that probably it is a miner when young (Pet. Nouv. vii. 532). This species is separable from *M. bipunctidactylus* by its whitish apical edging.

Pterophorus hodgkinsonii, Gregson (E. M. M. iv. 178).

This insect is characterised by Mr. Gregson, as follows:—

"Alar expanse, 7–8 lines. Head, face, thorax, body, and legs light, creamy, ashy-grey, lightest towards the cleft, very slightly irrorated with darker atoms; the discoidal and cleft-spots scarcely perceptible. Under wings rather darker than the upper wings."

Although not so stated, I apprehend that the "ashy grey, lightest towards the cleft," &c., refers to the primaries; if this is so, I have some specimens of *M. bipunctidactylus* from N. Devon, which agree very well with the description of *hodgkinsoni*. The time of year fits my insect also, and it differs from the type in precisely the same manner that *hodgkinsoni* is said to differ from *M. bipunctidactylus*. As I have not yet seen a specimen of *hodgkinsoni*, I cannot of course say that it is a form of *bipunctidactylus*, but I think it may turn out to be a form of that species, rather than a var. of *zophodactylus*, Dup.

Leioptilus osteodactylus, Zell.

IMAGO.—Expanse, 9½–10½ lines. Fore wing sulphur-yellow, streaked with brownish from the base to the middle of the wing, a broad ill-defined brownish patch on the costa before the apex, and a black spot at digital juncture; fringes pale brown. Hind wing pale, shining brown. July and August.

LARVA.—Ground colour whitish-brown, with a greenish tinge, and thickly sprinkled with minute black dots; dorsal stripe and subdorsal line

pale rosy pink; tubercles inconspicuous, hardly raised above the surface of the skin, two on each segment along dorsal area, from each of which a single brownish hair of moderate length is emitted; these hairs on the 3rd, 4th, and 5th segments curve forwards, those on posterior segments curve backwards; along the lateral area there is one wart with a moderately long hair on each segment. Spiracles black. Prolegs pale brown. October.

In seed-heads of *Solidago virgaurea*. The larvæ hibernated among the dried heads of *Solidago*, some making a snug cocoon-like retreat of the seed-down, others remaining without any such protection; and these assumed a reddish tinge during the winter. Description of larva previously published, 'British Pyralides,' p. 65.

Pselnophorus brachydactylus, Tr.

IMAGO.—Expanse, 10–11½ lines. Fore wing black, sprinkled with ochreous-brown scales, especially on the disc, which seems in consequence to be of a brownish black coloration, a small white dot on costa above digital juncture, from which an ochreous line, sharply angulated at the juncture, runs to the inner margin; fringes black, ornamented with white at the tip of outer and angle of inner digit; there are also some white scales edging the digital juncture, and a patch of white scales on the fringes of inner margin at the termination of ochreous transverse line. Hind wing blackish brown; fringes of second feather grey from base to middle, and white near the tip; there are also some white scales at junction of first and second feathers. Head and thorax colour of fore wings. Abdomen brown, ornamented with lateral white spots. Legs brown; tibiae with one and tarsi with four white marks or rings.

I have not seen a British example of this species. The above description is taken from a continental specimen. The genus *Pselnophorus* was founded by Wallengren for the reception of *brachydactylus* (Ent. Tidskr. ii. 96). The larva is said to feed on the under sides of the leaves of *Prenanthes purpurea*, also on *Lactuca muralis*, in May and June.

"The ground colour of the larva is pale dirty green; dorsal stripe darker, on each side of which is a row of tubercles bearing dark bristles, followed by another row bearing one dark bristle and a few small hairs; a third row occurs lower down, crowned with white bristles. Frey."—Leech, 'British Pyralides,' p. 66.

Acipitilia paludum, Zell.

IMAGO.—Expanse, 7 lines. Fore wing deep grey-brown, outer digit traversed by two white fascia-like streaks, edged with some black scales on the costa; fringes grey-brown, with some black scales at the tip and inner angle of outer digit, the latter bordered on each side with white cilia; the inner digit has some black scales at tip; two patches of black scales on the inner margin, the first preceded and the second followed by white cilia. Hind wings grey-brown, darker at the extremity of each feather-shaft, but there are no black scales in the fringes. June to August.

As a British insect, *A. paludum* was at one time supposed to be peculiar to the Cambridgeshire fens, but it has recently been

taken on heathy bogs in one or two localities in Dorset, *teste* Rev. O. P. Cambridge (Entom. xx. 326); it has also been recorded from Woolmer Forest. The larva appears to be unknown on the Continent, as well as in England; at least I cannot find any published description.

SOME NOTES UPON THE VARIATION OF
ARGYROPHINGA ANTIPODUM, DOUBLEDAY.

By W. W. SMITH.

In every country the law of variation operates with greater effect among particular groups and on certain species of Lepidoptera than others; *how* or *why* such should obtain has of late years presented a grand subject for original research to entomologists. In New Zealand, variation is constant to a greater or less degree among many species of both Macro- and Micro-Lepidoptera, and in some species is more marked than others. The case of *Argyrophinga antipodum* exhibits a striking instance of extreme variation among the few endemic species of New Zealand Rhopalocera.

For many years past while out collecting, I have been in the habit of netting great numbers of this butterfly, selecting the more marked forms, and liberating the remainder, on the grassy uplands and plains, still clothed in their native tussock grass (*Poa australis*). This butterfly in its season is generally numerous, and owing to its slow and somewhat laboured flight is easily captured. Among the specimens I have taken are some remarkable varieties, exhibiting all the phases or stages of variation to which a single species could be subject. Many individuals of both sexes differ considerably from each other in their ground colouring, the colours of the neuration, and in the number of ocelli. The typical colour of the male is given by Mr. A. G. Butler as "dark greyish brown, paler at base;" in my specimens every shade of brown is developed, while some are partially melanic forms. Among the females there is also considerable distinction, the general colouring varying from whitish yellow to rich dark orange. In a typical specimen the hind wings are crossed with three small ocelli, the centre one in the male being slightly the largest; among them are several having a broad blackish band crossing the wing from the inner to the outer margin, and enclosing four distinct ocelli. Others have the three ocelli much enlarged and coalescent, while a number possess only two or one ocelli, and in one specimen (a male) they are obsolete on all the wings. I lately sent a group of these varied forms to the Wellington Museum, where no doubt they can at any time be inspected by entomologists.

Mr. G. V. Hudson, the well-known Wellington entomologist, whom I requested to examine the group, has favoured me with a note regarding them; he considers them "most interesting and instructive," and states that he has specimens from the Nelson province "differing altogether" from them. As Nelson is west of the Alps in the South Island, the fact proves that the variation of the species is nowhere local, but general over the whole extent of the South Island. For many years I have collected in different parts of Canterbury, south of the Rakaia river, from the sea-shore to several thousand feet up the grassy slopes of the Alps; and for three seasons I collected in North Otago, a district which has been under cultivation for over a quarter of a century. After examining the specimens in the Dunedin Museum, captured in other localities in Otago, I think that no locality can be given as producing more varied forms, but that the remarkable variation of the species is unquestionably general over the whole area of the South Island.

As the great question of variation is of vital importance in fully elucidating the science of entomology, it seems to me imperative that entomologists should record the slightest variation in any species when first observed, as in some instances it has now assumed such complexity as to be almost impossible to trace its origin. A thorough knowledge of climatology in all its bearings on the variation of insects is also indispensable to every entomologist. There can be no question that many species of Lepidoptera are greatly influenced in all stages by changes of temperature or by the seasons; and from notes on the variation of this butterfly in relation to the seasons, made during many years, I am in a position to show that the species exhibits greater variation in some years than others. The winter (or wet season in New Zealand) of 1881 was exceptionally dry and mild during the summer, which was even and hot; the butterflies emerged in prodigious numbers, but all the individuals I examined showed less aberration in that year, including the early months of 1882, than any season I can give, before or since. The following winter was much colder, and was succeeded by a fine even summer; but the butterflies were nowhere so plentiful, and many of them, especially the males, were more variably marked than those of the preceding summer. Then followed the wettest winter, and equally wet and coldest summer, on record in New Zealand; every day of bright sunshine produced the emergence of some, and fresh individuals continued to appear until much later in the season than usual. In the same year (the early months of 1884) I collected the most variable forms of both sexes I had hitherto obtained. The close of the year and the first six months of 1885 were the hottest on record; and although the butterflies were plentiful, the greater number I netted were not so variable

or richly marked as in the preceding year. The two succeeding summers produced specimens which were about equal to 1885, as regards their numbers and markings. Last summer, which was preceded by a very wet winter, there was again a greater number of more richly marked and variable forms.

From the foregoing notes it will be seen that the variation of the species is most predominant in seasons succeeding wet winters. The same applies to *Chrysophanus boldenarum*. How the seasons operate in producing this effect requires careful investigation, and any satisfactory solution of this interesting and difficult problem can only, I think, be obtained through such recorded observations. [Vide *ante*, p. 20.—ED.]

One cause in New Zealand which affects the numbers and economy of many species of insects is the annual burning of the Tussock lands. They are fired to promote the growth of young grass, for sheep and cattle depasturing on it. I have no doubt that these terrible fires which occur in the early spring months, sometimes lasting for days, and spreading over many miles of open country, have long ago extirpated many species of insects and rendered others rare. Indeed, it is surprising that *A. antipodum* holds its own so well, seeing that it is in all stages almost exclusively a Tussock-frequenting species.

In the early days of the colony the seasons were more equable than now. The winter rains were more periodical, with less frost; and the summers more even, with fewer chills. The devastating fires, together with cultivation of the land, would soon assert their influence on the climate, and materially affect the economy of Lepidoptera. An abundance, scarcity, or change of food and environment, during the larval stage, is known to produce great variations among certain species; with *A. antipodum*, the finest marked and best-developed forms are evolved in humid seasons, and such succeeding wet winters. The abundance of food which obtains, and an unchecked and vigorous growth of the larvæ during such seasons, would account for this. I cannot say whether natural selection, in the case of the female, "plays many parts in perpetuating the variation of the species," as I have only twice observed them in copula; but in both cases the males were large and richly-marked individuals. Neither am I in a position to say that the tendency to darkening in the colours of the species is, in humid seasons, a case of atavism; but I incline to such an opinion, as the preceding geological period in New Zealand was immensely more humid than the present, a fact which I think favours such a view.

On some future occasion I hope to add a little more on the subject, and to give the life-history of this peculiar butterfly.

East Belt, Ashburton, New Zealand, September 15th, 1888.

DESCRIPTION OF A NEW GOLIATH BEETLE FROM
CENTRAL AFRICA.

BY OLIVER E. JANSON, F.E.S.

In a small but interesting collection of *Cetoniidæ* recently received from the neighbourhood of Stanley Falls on the Upper Congo, I have obtained a male of a very fine species of *Neptunides*, and for the female I am indebted to Mons. R. Oberthür, who has more recently received, and forwarded to me for examination, both sexes collected at Ouganda by Mons. Denoit. I propose naming this fine species after the illustrious leader of the Emin Pasha Relief Expedition and explorer of Central Africa.

Neptunides stanleyi, n. sp.

Elongate, convex, bright golden green, the femora tinged with fiery red, margins of the clypeus, including the horns and median carina, the knees, inner side and apical spines of the tibiæ and the claws, black. Head deeply impressed on each side in front, the impressions divided by a strong, sharp, central carina, which extends from the base of the median horn to the vertex; the median horn stout, recurved and dilated towards the apex, the lateral horns divergent, flattened and rather obtuse. Thorax very convex, subglobose, the sides a little emarginate and scarcely narrowed from the base to the middle thence somewhat abruptly rounded and narrowed to the apex, the surface almost impunctate. Scutellum broad, triangular. Elytra scarcely broader than the thorax at the base, a little narrowed towards the apex, the suture slightly elevated posteriorly, extremely finely and sparsely punctured. Pygidium, underside and legs finely and remotely punctured; mesosternal process flat, broad, rounded at the apex; anterior femora broad, the underside fringed with dense, short, yellow pubescence, and armed near the apex with a large, acute, curved tooth; anterior tibiæ emarginate and obtusely bi-dentate at the base, slightly emarginate on the outer side and grooved on the inner side towards the apex, the apex with two acute teeth on the inside and one behind. Length 36—38 millim.

In the female the head is strongly punctured, impressed behind, and has a longitudinal carina in the centre, the apex of the clypeus has a small and nearly square projection in the middle, and the lateral angles are slightly prominent, the thorax is much less convex than in the male, the elytra have more or less distinct rows of fine punctures, the anterior femora are unarmed, the anterior tibiæ are dilated towards the apex and acutely tri-dentate on the outside, and the intermediate and posterior tibiæ have an acute tooth below the middle. Length 30 millim.

Habitat, Upper Congo District.

The male is larger and proportionately narrower than *N. polychrous* and differs in the uniform colouring of the body, the head is broader, with the central horn stouter and gradually dilated towards the apex, the lateral horns are less curved and more obtuse, the median carina is more prominent and extends to the vertex, and there is no distinct transverse ridge on the forehead.

as in *polychrous*; the thorax is also much more convex and less rounded at the sides behind, the anterior femora are broader and have a denser fringe and larger sub-apical tooth, the anterior tibiæ are more dilated near the base, channelled on the inside, and without teeth except at the apex.

22, Perth Road, Stroud Green, N., January 19, 1889.

CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.

By J. W. TUTT, F.E.S.

(Continued from p. 12.)

Xylophasia, St., *monoglypha*, Hufn. (*polyodon*, L.).

This is another most variable species, ranging from specimens of a pale whitish grey ground colour, through almost every intermediate shade to deep unicolorous brown and black. The melanism on our southern coasts tends more to the production of dark, more or less unicolorous, brown forms; that in the North of England, Scotland and the west coast of Ireland to the production more especially of intensely black forms, although occasionally more or less black forms are taken in the south, and beautiful rich brown forms occur in North Britain and the west coast of Ireland. I would also draw attention to the great variation in the direction, shape and size of the orbicular stigma; sometimes this is quite linear, sometimes oval, and sometimes round; sometimes large and sometimes comparatively small.

This species seems to vary but little on the Continent, so far as is at present known, and scarcely any continental authors appear to have figured or described any varieties except Staudinger, who has recently named one intensely black form *æthiops*. Hübner figures the type, with a pale patch along the inner margin and near the anal angle, as *radicea*. The Linnæan description ('Systema Naturæ,' p. 853, No. 170), is as follows:—"Noctua spirilinguis cristata, cinereo-nebulosa; margine postico multidentato." "Alæ superioris margo posticus circiter 8 dentibus terminatus." Guenée in his 'Noctuelles' mentions nothing about the species being variable, although he says, "common everywhere." Haworth describes the pale variegated form, which is generally looked upon as the type, as: "Noctua cristata, alis deflexis dentatis variegatis: striga postica dentatis albis, thoracis crista elevata bifida." "Corpus pergrossum. Alæ anticæ ex fusco parum fulvicanes, nebulis variis nigris pallidisque. Stigma anticum oblongum, et valde obliquum sive subsupinum. Juxta marginem posticum striga profundissime et acutissime dentata alba nigro interne adnata. Posticæ alæ cinereo-fuscæ, fimbriæ

fuscâ, ciliis fulvicantibus." ('Lepidoptera Britannica,' pp. 186, 187). He also adds, "Variat, alis minus variegatis." Thanks to my friend Herr Hoffmann (Hanover), I have been able to get a translation of Hufnôgel's original description, which is as follows:—"With a bluish tinge, partly light and partly dark grey, with a Latin **W** in the hind margin."

Treating therefore as the type the variegated form, which has the whitish blotch on the inner margin, near the anal angle, we have four striking varieties, joined of course by intermediate forms. These are:—

1. A suffused brown or greyish brown form, with the markings distinctly traceable, though obscured, var. *obscura*.

2. A deep, intensely brown form, with the markings scarcely traceable, var. *brunnea*.

3. A black form with moderately distinct markings, v. *infuscata*.

4. An intensely black form with the markings almost entirely obliterated, var. *æthiops*.

α, var. *obscura*, mihi.—A suffused brown or greyish brown form with all the pale markings of the type brownish or dull greyish instead of whitish. The whole of the markings of the anterior wings clearly traceable, although obscured. The brownish transverse lines (pale in the type) margined with darker brown. My specimens have come from Strood, Greenwich, Deal,* Sligo, Barnsley and many North of England and Scotch localities.

β, var. *brunnea*, mihi.—The anterior wings a deep, rich brown, with the discoidal spots and transverse lines traceable. This is almost the same form as *infuscata*, with the ground colour deep brown instead of black. My specimens have come from Mr. Percy Russ, of Sligo, Mr. Hendersou, of Glasgow, and Mr. Harrison, of Barnsley. I have also received it from a few other localities, but all northern. Some of my Deal varieties of var. *obscura* approach this form closely. Mr. J. Jenner Weir (Entom. xiv. 220), writing of the Hebridean *polyodon* remarks:—"The parallel variety to *combusta* (*rurea*) is of the richest dark chestnut-colour, very glossy, and, as in the case of *X. rurea*, the intermediate varieties are numerous."

γ, var. *infuscata*, White. This variety was named by Dr. F. Buchanan White ('Fauna Perthensis,' Part. I). It was given to those very dark, black specimens, abundant in Scotland, the North of England, and the West of Ireland, but which are so rare in the South of England. The distinctness of the typical pale markings varies exceedingly, but generally they are distinctly marked in greyish. Mr. G. T. Porritt, in his 'List of Yorkshire Lepidoptera,' p. 74, says:—"The black form, var. *infuscata*, White, is of frequent occurrence, both in the east and west of the county." I have captured it myself at Deal, and have received it from Barnsley, Fleetwood, Hartlepool, Glasgow, Aberdeen, Sligo, and many other localities, chiefly northern. A record of the occurrence of this variety at Tenby is made in the 'Entomologist,' xxii. 15. The variety also occurs freely in

* During the summer of 1888 scarcely a pale *polyodon* occurred on the Deal sand-hills; almost all were *obscura*. I even captured one specimen of var. *infuscata*. I have no doubt this was due to the excessively wet season.

the Orkneys, Shetlands and Hebrides. Mr. C. G. Barrett (Ent. Mo. Mag. vol. xxii. p. 125), reports it as "occurring near Dublin."

♂. var. *athiops*, Stdgr.—This is an extreme development of the var. *infuscata*, White, the whole of the anterior wings intensely black, with no paler markings, and scarcely the slightest trace of any markings whatever; some specimens are perfectly unicolorous. The most perfectly unicolorous specimens I have, are from Mr. Percy Russ, of Sligo, although specimens from the Lancashire coast, Glasgow and Aberdeen, are but little behind them in intensity.

(To be continued.)

A YEAR'S WORK IN PORTLAND.

BY MAJOR CHARLES E. PARTRIDGE.

WHEN a rumour reached us in the autumn of 1887 that the regiment to which I have the honour to belong was to move to Portland in the following spring, our spirits generally fell to zero, for the island bears a bad name. Personally I was delighted, for I looked forward to working great havoc in the insect world. February arrived and my hopes were realised. These, however, were rudely shattered when I first saw the place, for to all appearance it was one huge quarry. A fuller inspection later was hardly more satisfactory, for there was not a sign of the wealth of flowers, herbage, &c., which was soon to appear. The evil reports circulated about the island are by no means exaggerated. The weather is simply atrocious. If it doesn't rain it blows, and when tired of both it fogs; and such fogs too! Worse still, one cannot foretell for an hour how many of these pleasant surprises are in store, the changes come so quickly. Many a time have I left home certain of success, and before reaching the ground all was changed, and I returned home disgusted. I can also speak feelingly of the hardness of the Portland boulders, with which the whole place is strewn. Many an ugly fall have I had, and often have I risen a sorer and sadder man. Owing to these many drawbacks and the really dangerous nature of the ground, Portland can never become a popular hunting ground; and I am confident only those living on the spot can ever hope to work it successfully. Sad to relate, a railway is now in course of construction, further circumscribing an already very limited extent of ground, and before many months are over smoke and an influx of "trippers" will ruin the place, and good local insects will be things of the past.

Owing to bad weather, which on more than one occasion lasted for several weeks, also to the fact that the ivy was so backward that I have not worked it, and last, but not least, to the fact of my being utterly ignorant of the habits, &c., of the Tineæ, the following list is far smaller than it would have been in better hands; nevertheless the total number reached 339 species.

Twenty only of the sixty-five species of Rhopalocera came under my notice. *Pieris brassicæ* and *P. rapæ* common, but *P. napi*, on the contrary, extremely scarce. *Euchloë cardamines* and *Gonopteryx rhamni* were represented each by a single specimen, as also *Polyommatus phloas*. *Pararge megera* and *Satyrus semele* were fairly numerous, *Epinephele ianira* also. *Vanessa cardui*, *V. atalanta* and *V. urticæ* were out in great numbers; but *V. io* I only found in the larval state, and then even very scarce. *Colias edusa* produced but six specimens. *Lycæna icarus* and *L. ægon* swarmed everywhere; and *L. minima*, though local, was by no means scarce. *L. corydon* was occasionally met, though Portland can boast of no chalk. *Nisoniades tages* and *Syrichthus malvæ* occurred but sparingly.

Of the Sphinges I took but three. *Chærocampa porcellus*, two at light. *Macroglossa stellatarum* was rarely met with, and but one larva of *Sphinx ligustri*, though privet abounds everywhere.

The cocoons of *Zygæna filipendulæ* occurred in every direction, each blade of glass having its burden; but of *Z. trifolii* I saw but a single specimen. *Lithosia lurideola* came freely to light, and *Euchelia jacobæ* was common. *Arctia caia* I never saw in the perfect state, and the larvæ but rarely. Of *Spilosoma mendica* I obtained a few larvæ, and *S. lubricipeda* and *S. menthastri* were equally common, both in the larval and perfect states. *Hepialus hectus* and *H. lupulinus* were extremely plentiful, but *H. sylvinus* was represented by one specimen only. *Porthesia chrysorrhæa* and *P. similis* now and then turned up at light. *Bombyx neustria*, but a few larvæ. *B. rubi* was very plentiful in the larva state, each bramble bush having its contingent. *Cilix glaucata* occurred sparingly, but of the second brood I saw but one specimen. Of *Dicranura vinula* I took one pupa and three larvæ on the only poplar, or rather apology for a poplar, in the island. I took two specimens of *D. furcula* at light near the only clump of willows in the island. *Phalera bucephala* a few larvæ only.

I saw but one *Thyatira derasa*, and *Bryophila perla* was fairly common. *Acronycta psi* produced but two imagos. *Leucania impura*, *L. lithargyria*, *L. pallens*, and *L. conigera* swarmed both at sugar and light; but *L. comma* seldom turned up. I got a nice series of *Axylia putris* at sugar. *Xylophasia lithoxylea*, *X. rurea*, and *X. sublustris* were all scarce; but *X. monoglypha* was a perfect pest. Of *Neuria reticulata* I took about a dozen specimens at sugar, but they were out so much earlier than the date given by Newman that I almost missed them. The same remark applies to *Heliophobus hispidus*, which was exceedingly plentiful (I took sixty-four in two evenings). *Neuronia popularis* and *Chæræa graminis* produced but one specimen each, both at light. *Cerigo matura* came freely to sugar, and *Luperina testacea* was easily obtained by searching the grass-stems with a lamp. *Mamestra*

sordida was not scarce at sugar, and by the same means I took two *M. abjecta*; of *M. albicolon* I obtained but three specimens, and *M. brassicæ* was not so common as I expected. *Apamea basilinea* was only too plentiful, but the same could not be said of *A. gemina*; of *A. didyma* I took a long series, with some excellent varieties. *Miana strigilis* was most partial to sugar, and by the same means I got a good series of *M. literosa*; *M. bicoloria* was very abundant. *Grammesia trigrammica* was well represented, though I got but few specimens of the var. *bilinea*. *Caradrina alsines*, *C. taraxaci*, and *C. quadripunctata* occurred commonly.

The Agrotidæ were well represented:—*Agrotis puta*, *A. segetum*, *A. exclamationis*, and *A. corticea* caught at sugar; at the same bait I got *A. vestigialis* and *A. tritici* sparingly; *A. lunigera* was not scarce; *A. simulans* and *A. lucerneæ* were attracted by the blossom of the wild sage; I took one specimen of *A. cinerea* at sugar; and by the same means *A. nigricans*, *A. saucia*, and *A. suffusa*, though not very commonly.

Noctua plecta, a few, both at light and sugar; *N. c-nigrum* and *N. triangulum* were both very scarce; *N. festiva* and *N. xanthographa* both very common; but *N. baia* I seldom came across.

Triphæna ianthina, *T. fimbria*, *T. comes*, *T. interjecta*, and *T. pronuba* were all equally plentiful. Of *Amphipyra tragopogonis* I secured but two. *Pachnobia rubricosa* was plentiful at black-thorn bloom. *Teniocampa stabilis* was very scarce, and hardly less so *T. gothica*. *Anchocelis lunosa* was scarce. *Cerastis vaccinii* and *C. spadicea*, common. *Scopelosoma satellitia* and *Xanthia circellaris*, also *Calymnia trapezina*, four specimens; and *C. affinis* but one. I obtained one specimen of *Eremobia ochroleuca* at teazle bloom, and one also of *Polia flavicincta* at sugar. *Epunda lichenea* I took sparingly, though had I continued to search later I should have had greater success. *Miselia oxyacanthæ* came freely to sugar, and I obtained some good varieties. *Phlogophora meticulosa* was the plague it always is. *Aplecta nebulosa* was very scarce. *Hadena adusta* produced some good varieties; *H. dentina*, a few; *H. trifolii*, not scarce, and *H. oleracea*, very common; *H. thalassina*, but one specimen; and one specimen of *Xylocampa aureola*. *Calocampa vetusta* and *C. exoleta*, but rarely met with. Of *Cucullia umbratica* I took but two specimens, but found the larvæ of *C. absynthii* very plentiful, but very late (many of mine had not gone down at the end of October). *Gonoptera libatrix*, not common. *Plusia gamma* swarmed everywhere; *P. ni* I was lucky enough to obtain once, which was duly submitted to and identified by Mr. Charles Barrett. *Habrostola tripartita* occurred once. *Heliothis peltigera* I took twice, and, oddly enough, both specimens were taken on the same teazle, at an interval of three weeks. *Rivula sericealis* and *Hypenodes costæstrigalis* were fairly numerous.

(To be continued.)

PLUSIA ILLUSTRIS IN IRELAND.

BY G. HERBERT CARPENTER.

AMONG a number of moths taken by Miss Alice Hull, near Castle Kevin, in County Wicklow, in August, 1887, and lately given by her to me for identification, I was greatly surprised to find a specimen of *Plusia illustris*.

The moth is figured in Curtis's 'British Entomology' (vol. xvi., p. 731), published in 1839, and is there recorded as having been taken on Salisbury Plain and in South Wales. Mr. H. T. Stainton has most courteously informed me that these captures took place before 1810, and that the insect has never since been seen in Britain. Both he and Mr. de V. Kane agree that it is quite new to Ireland.

The insect is admitted by Humphreys and Westwood into their 'British Moths' (1843). It is to be found among the reputed British species in the Doubleday List, but in Mr. R. South's List it is refused a place even among these. Its re-appearance in our islands, after so many years, is therefore a noteworthy fact. It seems very strange that, if Miss Hull's specimen is a migrant from the Continent, no individuals have been taken in Great Britain. On the other hand, it is equally strange if the insect has been breeding among us unnoticed for over seventy years. The ordinary food-plants of the caterpillar, *Thalictrum aquilegifolium* and *Aconitum lycoctonum*, are both confined to the Continent. *T. minus*, however, occurs sparingly on the Wicklow coast, and species of both genera may very possibly be cultivated in the locality.

Science and Art Museum, Dublin, January 14, 1889.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

VANESSA ANTIOPA IN KENT.—About the middle of September, 1888, a worn specimen of *Vanessa antiopa* was captured by a gentleman with his hat, while it was at rest on a gooseberry bush in his garden near this place.—JOHN TYRER; 27, Jeffry Street, New Brompton, Kent.

DIMINUTIVE POLYOMMATUS.—On September 13th I took at Sandy, in Bedfordshire, a very small specimen of *Polyommatus phlœas*. The insect does not measure more than ten and a half lines across the wings.—HENRY A. HILL; 20, Fellows Road, Hampstead, N.W., November 4, 1888.

ABSENCE OF LYCÆNIDÆ.—In Mr. Adkin's article upon the influence of meteorological conditions upon insect life (Entom. 7) reference is made to the absence of a second brood, in 1888, of *Lycæna bellargus*. During the past fifty summers in which I have collected, on and off, in the neighbourhood of Chatham, I have never, until last autumn (1888), missed

seeing the second brood of this butterfly. Although I carefully searched, for over two months, all our local downs, warrens and chalk-pits, I failed to find a single specimen of the autumn brood of either *L. bellargus*, *L. astrarche*, or *L. minima*. *L. corydon* was plentiful in August. It would be interesting to know whether this absence has been general, or only local; also whether the pupæ, which should have produced the second brood, are lying over to form the first brood for next year.—JOHN TYRER; 27, Jeffery Street, New Brompton, Kent.

THECLA W-ALBUM IN OXFORDSHIRE.—In 1868 I discovered a locality in South Oxfordshire for *Thecla w-album*. So abundant was it then I could have taken very large quantities. The spot specially selected by them was a considerable clearing in a beech wood, where plenty of brambles grew. I remember well the great numbers attracted by its bloom. Some of the examples I then took I have still. I have never visited (owing to long absence) the spot since for *T. w-album*, till last July, when Mr. William Holland and myself went to my old collecting-ground, hoping to re-discover its haunts. Instead of the spacious clearing which once existed, a remnant alone remained, some twenty yards square; the rest was ploughed land, but on and within a few yards of the small part left we netted nearly fifty specimens. Considering the old habitat had been nearly destroyed, we thought ourselves exceptionally fortunate in securing so many. These are, I believe, the only recorded captures of *T. w-album* in Oxfordshire, and if so, adds another butterfly to the county list. I may add that wych-elm grows sparingly among the beech at one end of the wood.—J. CLARKE; Reading, January 9, 1889.

DEILEPHILA GALII IN LANCASHIRE.—On July 27th I caught a specimen of *D. galii* here, flying over some white campion at dusk. Next day my son caught another, some two miles farther north, flying over some rest-harrow, at 11 a.m., in bright sunshine. One of the boys caught another at dusk, on some honeysuckle. During the latter end of September, I was lucky enough to find seven larvæ at Lytham, and on Sept. 27th Mr. Irving, the head master of this school, found one in the grass in front of the school here. These localities range over a stretch of about four miles along the Lancashire coast.—T. BAXTER; Collegiate School, St. Anne's-on-the-Sea, *via* Preston.

SESIA MUSCIFORMIS IN SCOTLAND.—I took about a dozen pupæ of the thrift clearwing, on the Scotch coast, in June last. — W. R. SCOWCROFT; Fern Lea, Gardner Road, Prestwich.

LITHOSIA COMPLANA ON THE COAST.—In reply to Mr. Jeffery's note (Entom. xxi. 322). I may say that as several years ago I bred *L. complana* from the larva, it evidently frequents the coast, and feeds on stone-lichens. I have had two larvæ since, but was not fortunate enough to bring them through. — W. R. SCOWCROFT; Fern Lea, Gardner Road, Prestwich, Manchester.

FOOD OF LITHOSIA COMPLANA.—With respect to Mr. Jeffrey's query (Entom. xxi. 332), I find the following note in 'Entomologist's Weekly Intelligencer,' vii. 188;—"*L. complana*. Bred from four larvæ found feeding on lichens on decayed ash. They did not answer to the description given in

the 'Manual,' but precisely resembled those of *complanata*. Except that the broad orange-coloured lateral stripe was interrupted by the ground colour, giving it the appearance of a row of large orange spots." This passage was written in 1860, and as the writer, Dr. Allchin, then a well-known lepidopterist, on the same page states that he also bred three *lurideola* (*complanata*), it is probable that he was correct in his species. *L. complana* is, certainly, both a coast and inland species. The first specimen I ever took was from the New Forest; it flew up at my feet from amongst heath, quite half a mile from any trees. For the past few years I have found it fairly abundant on the heaths in this neighbourhood, in most cases quite away from any trees that had any lichen upon them. Now the heaths about here are very thickly carpeted with lichens, which in places almost smothers the growth of *Calluna*, *Erica*, &c., and this peculiarity appears also to those in the New Forest. I have not the slightest doubt but, that in the above localities, the usual food-plant is one or more of these ground-lichens. During August, 1887, I found this species commonly on the sand-hills near Shoeburyness, in Essex (Entom. xx. 224). At the time I did not look for a probable food-plant, but on a subsequent visit during September this year (whilst on a successful hunt for larvæ of *Deilephila galii*) I found the ground on which I had captured the specimens of *complanata* thickly carpeted with moss. This I should consider to be, in this locality, its probable food-plant. I have never worked the Deal sand-hills at the time when the species would be flying, but possibly the spot resembles that of Shoeburyness in this particular. I quite agree with Mr. Tutt that species of this family, in some instances, are able to exist upon other food than lichens. I have seen females of *L. pygmeola* in abundance in spots where no lichen, moss, or in fact anything other than marram grass and sand occurred.—W. G. SHELDON; Rose Cottage, Oval Road, Addiscombe, January 7th, 1889.

[I have found *Lithosia caniola* feeding upon *Lotus corniculatus*, at Howth, in Ireland.—JOHN T. CARRINGTON].

TEPHROSIA CREPUSCULARIA: CORRECTION.—Mr. Adkin's note on the "Influence of Meteorological conditions upon Insect Life" (Entom. 7) has called my attention to an error which has crept into the few remarks which I recently made upon the subject (Entom. xxi. 283). The date there given for my capture of *Tephrosia crepuscularia* should have been May 5th, not July 5th.—GEO. C. GRIFFITHS; 1, Hale Bank, St. Matthew's Road, Cotham, Bristol, January 7, 1889.

AGROTIS CORTICEA, MELANIC VARIETY OF. — With reference to Mr. Tutt's remarks at p. 15, *ante*, I beg to call attention to p. xxxii. of the 'Proceedings' of the meeting of the Entomological Society of London, on October 3rd, 1888, which Mr. Tutt appears to have overlooked. It is there stated that "Mr. H. Goss exhibited, for Mr. W. J. Cross, an extraordinary melanic variety of a species of *Agrotis*—believed to be either *segetum* or *corticea*—caught by the latter near Ely, in July last." Mr. Tutt may probably be right in his determination of the species to which the variety in question belongs; but his opinion differs from that expressed by Mr. Jenner Weir and Mr. W. Warren. I believe it was correct to apply the term "extraordinary" to the variety in question, which is not a constant variety of general distribution nor a local form; but it is probable

that the use of the term "extraordinary" was, to some extent, prompted by a desire on my part to please Mr. Cross, by leading him to suppose that his capture was of more than ordinary interest.—H. Goss; Berrylands, Surbiton Hill.

AGROTIS AGATHINA, &c.—With respect to the question of Mr. Butler (Entom. 15), as to the usual way to capture this species, it is, as Mr. Carrington says, by searching the flowers of *Calluna vulgaris* with a lamp at night; but after some experience, I am decidedly of opinion that there is even a better way, if indeed one could but master the initial difficulty. I first commenced to search for *A. agathina* on the Shirley Hills in 1885; in that season I could not find it; in 1886 I got three specimens; in 1887, eighteen; and last year, one only. It is probably well known to most readers of the 'Entomologist,' that it was the custom of the London collectors of the last two generations to come to Shirley, especially for this species, and I have been repeatedly told that fifteen or twenty years ago the larvæ could be swept from heather in the spring in hundreds, together with those of *Noctua castanea*, *Scodionia belgiaria*, *Aspilates strigilaria*, &c. It is very different now, and the curious circumstance is, that whilst *A. agathina* and the two Geometers are very rare, *castanea* appears to be quite as common as in the old days. As above stated, I searched unsuccessfully for the species during 1885, and for several evenings in 1886, until one night I turned my lamp upon a fine bush of bloom and saw a sight that electrified me: there were two *agathina* and one red *castanea* upon it; the *agathina* were apparently quiet, and merely noting that they were male and female, I proceeded to box my *castanea*, which was just on the point of leaving. Having effected my object, I turned back to where the *agathina* should have been and found them gone, but within six feet of the spot I got three other specimens, all males. In the following year, after several nights unsuccessful work, I took a freshly-emerged female. Mindful of my former experience, I searched well the heath round her, and found within a small space, five males. A few nights after this, I took four specimens close together, males again, and have no doubt there was a female in the neighbourhood. I feel certain that if a virgin female was bred and placed in a muslin-covered box, amongst the heather, in a locality where the species occurred, she would attract to her, freely, the males; but there is the rub! the successful breeding of *agathina* has been solved by but few, and it is no easy thing to obtain one. I believe the species has been bred somewhat freely, of late years, by some of our Scotch collectors residing at Perth, and possibly they may have tried assembling for it. Perhaps they will give us their experience in capturing the species.—W. G. SHELDON; Rose Cottage, Addiscombe.

DASYCAMPA RUBIGINEA IN SOMERSET.—On November 13th last, I took a fine and fresh specimen of this moth at ivy. A careful search on several succeeding evenings failed to discover another. This is the second I have taken in this county.—(Rev.) J. SEYMOUR ST. JOHN; Baltonsborough, Glastonbury, November 20, 1888.

AMPHIDASYS BETULARIA, VAR.—Mr. J. Arkle says (Entom. xxi. 316), that while collecting in the Delamere Forest, he came across a matter which has been considered of some importance, viz., a type female and a black male of *Amphidasys betularia* in copula. I may say that similar unions

have been commonly observed in this neighbourhood, where the black variety is taken as freely as the ordinary type. Some years ago, when I was a member of the Middleton (Lancashire) Entomological Society, two of the members found a black male and a buff female united. These were two extreme varieties, and from this copulation many pure buff varieties, as well as jet-black ones, were produced. For several years, offspring of these insects were brought to the monthly meetings, showing variation in every form, from the ordinary type to a pure buff, as well as black. It was most interesting to see these insects, some of which were exhibited alive. I had myself a few larvæ from these parents given to me, from which I raised two buff varieties, one of which I gave to a friend.—J. T. RODGERS; 45, Radcliffe Street, Busk, Oldham, Manchester, December 19, 1888.

EXTRACTION OF MOTH FROM PUPA.—I have just read, with much interest, Mr. J. Anderson's note on the extraction of a moth from its pupa (Entom. xxi. 236), having made several experiments of the same nature myself with, however, quite opposite results. In 1880 I carefully extracted a fully developed specimen of *Amphidasys betularia* from the pupa, and although the markings were all clearly discernible, the wings never expanded to a larger size than they were while the insect was in its pupa. In October, 1887, I had about ten pupæ of *Charagia virescens* amongst damp moss. These insects always have considerable difficulty in emerging when in captivity, as in their natural condition they are in the habit of only projecting the anterior portion of their body from the burrow in the tree, the spines on the abdomen of the pupa retaining the old case firmly, while the enclosed insect draws itself out. I am therefore always very anxious about these pupæ, especially as they are very hard to obtain, and have consequently been led to extract several which had been endeavouring to emerge for some days previously; in all these cases, however, the wings never expanded, the insects so treated being completely useless. That the moths were quite mature there could be no doubt, as I always waited until the thoracic plates were ruptured before I attempted to assist the moth. As I have made at least eight experiments, including one this month on *C. virescens*, I cannot but think that Mr. Anderson's results must be exceptional.—G. V. HUDSON; Wellington, New Zealand, October 17, 1888.

RETARDED DEVELOPMENT.—Early in June I received some young larvæ of *Bombyx castrensis* from a friend. Two larvæ are still feeding, though the others have long since pupated. Last month I took over eighty larvæ of *Anarta myrtilli* on the Quantock Hills, and a few are yet left feeding. In my garden I have a number of larvæ of *Pieris brassicae* in various stages, while but four days ago, an imago of *Plusia gamma* emerged from a pupa in my cage. In 1886 I had some larvæ of *Lophopteryx cuculla*, which duly fed up and turned into pupæ. All but two emerged in June of last year. Of these two, one emerged the following 3rd of September, and the other on May 14th last.—(Rev.) J. SEYMOUR ST. JOHN; Biltonsbrough, Glastonbury, November 20, 1888.

CIDARIA RETICULATA: ERRATUM.—Mr. Murray desires it to be understood that he has had poor success in rearing *C. reticulata*, whereas (Entom. 16. line 8) he was made to say that he had never reared that species.

D.J.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — *The Fifty-sixth Anniversary Meeting, Jan. 16, 1889.* — Dr. D. Sharp F.L.S., President, in the chair. An Abstract of the Treasurer's Accounts, showing a balance in the Society's favour, was read by Mr. Osbert Salvin, F.R.S., one of the Auditors; and Mr. H. Goss read the Report of the Council. It was announced that the following gentlemen had been elected as Officers and Council for 1889: — *President*, the Rt. Hon. Lord Walsingham, M.A., F.R.S.; *Treasurer*, Mr. Edward Saunders, F.L.S.; *Secretaries*, Mr. H. Goss, F.L.S., and the Rev. Canon Fowler, M.A., F.L.S.; *Librarian*, Mr. Ferdinand Grut, F.L.S.; and as other Members of Council, Mr. Henry W. Bates, F.R.S.; Capt. H. J. Elwes, F.L.S.; Mr. William H. B. Fletcher, M.A.; Mr. F. DuCane Godman, M.A., F.R.S.; Prof. Raphael Meldola, F.R.S.; Dr. Philip B. Mason, F.L.S.; Mr. Osbert Salvin, M.A., F.R.S.; and Dr. D. Sharp, F.L.S. Dr. Sharp, the outgoing President, then delivered an Address, for which a vote of thanks to him was moved by Capt. Elwes, seconded by Mr. Salvin, and carried. A vote of thanks to the Treasurer, Secretaries, and Librarian was moved by Mr. J. W. Dunning, seconded by Lord Walsingham, and carried. Mr. Saunders, Mr. Goss, and Mr. Grut severally replied. — H. Goss, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — *December 27th, 1888.* T. R. Billups, President, in the chair. Messrs. F. E. Fenton, F. P. Perks, J. Scudder, and W. Reed were elected members. Mr. F. E. Strong exhibited full-fed larvæ of *Bombyx quercus*, L., from Abergele, N. Wales, and made some remarks thereon. Mr. R. Adkin, a long series of *Pygæa anachoreta*, and remarked that Mr. Gregson, in a recent article on this species, suggested that the continental specimens were readily distinguishable from British by their ashy grey shade. The series now exhibited were all bred from one stock, and varied from a brown tinge to the most ashy grey tints; the exhibitor therefore thought that too much reliance should not be placed on the shade of colour. Mr. Billups read a paper, "A partial list of Parasitic Ichneumonidæ, with the hosts from which bred, reared during the last three years by a few members of the Society." The list comprised about 100 species, numbering some thousands of specimens, many of the species being evidently new. Mr. Billups expressed a wish that members would assist him in identifying parasites of Lepidoptera, by saving all that they might breed during the coming season.

January 10th. — The President in the chair. Mr. Adkin exhibited *Noctua glareosa* from Kent, Barnsley, York, Perth, Forres and Shetland; the Shetland specimens and one of those from Perth were melanic, the others being of the pale grey or slightly rosy type. Mr. J. A. Clark, dark varieties of *Cidaria suffumata*: black and a suffused form of *Melanthia bicolorata*; and a fine banded variety of *Oporabia dilutata*. Mr. Tugwell, a series of *Boletobia fuliginaria*, with an empty pupa-case and sketches of larvæ at rest and feeding; and contributed notes in which he stated that in his opinion the insect was a true Geometer rather than a Noctua. Mr. White exhibited a coloured drawing of a variety of *Catocala nupta*, having the inferior wings blue, taken by Dr. Laver, at Colchester. Mr. E. Joy, bred specimens of *Pygæa pigra*, from Wicken Fen. Mr.

Chiltenden, very black forms of *Acidalia inornata*, taken near Ashford, Kent. Mr. Jenner Weir exhibited, with other species, a female specimen of *Anosia plexippus*, which he had received from Mr. Cockerell, Custer Co., Colorado, and stated that although in this specimen the inner edge of the wing was quite as black as those received by him from Canada and Hudson's Bay, it yet differed in the colour of the spots on the fore wing being all white, whereas in the northern specimens the four large central spots were of a fulvous brown, little inferior in richness to that of the disc of the wing. At the same time he showed a water-colour drawing, of the specimen, taken at Lindfield, 1876, from which it appeared that the example then captured resembled the more northern form of the species. Male and female specimens of *Pieris oleracea* were also exhibited by Mr. Weir, who said he had always contended this species was not identical with *P. napi*; and he had received a communication from Mr. Scudder, who wrote that he had now been able to make the comparison wished, and could report that the two species were distinguishable from each other in the caterpillar and chrysalis stages, as surely and readily as *P. napi* and *P. rapæ* could be distinguished in the same stages. Mr. T. R. Billups exhibited types of eighty species of Hymenoptera, parasitic on Lepidoptera, with cocoons from which some had emerged, and larvæ from which several parasites had been reared.

OBITUARY.

THOMAS EEDLE was born at Pinner, Middlesex, June 13th, 1829, and died on the last day of 1888. From his earliest youth he showed an innate fondness for Nature, and especially for her subjects in their homes. A few years ago, one of our popular writers belauded the works of a Scotch naturalist, who at best was but a *dilettante*. Mr. Smiles need not have gone so far north for a subject, for none would have suited him better than Thomas Eedle. Such he was,—painstaking, observant, and most generous in helping young students; for though he made his study his business, he never withheld a locality, nor a bit of useful knowledge, “for trade purposes”; although first a lepidopterist, he took an all-round interest in Natural History, nothing coming amiss to him. In 1869 and 1870 Mr. Eedle made two very successful excursions to Rannoch, in Scotland, where he took a specimen of the then very rare *Pachnobia hyperborea*, the second specimen which had been found in Britain. In 1871, Lord Walsingham took the subject of this notice with him on his visit to the Western States of America, when Eedle acted as collector and assistant during his Lordship's explorations until 1872. On his return, Eedle collected for Lord Walsingham in Horning Fen and elsewhere. While in the fen he captured a long series of *Vanessa antiopa*, probably the largest take of that species in this country in modern times. In 1874 he made a third summer's stay in Scotland, after which he settled steadily to his business of taxidermist and dealer in Natural History subjects. Among his larger work is some in the museums of the Marquess of Ripon, Lord Walsingham, and others. Much that is known of several of the rarer Lepidoptera of the Home Counties is due to Eedle, especially of such species as *Erastria venustula*, *Chrosis bifasciana*, *Hypercallia citrinalis*, *Aleusis pietaria*, &c. as a founder of the Haggerston Entomological Society, and was generally respected for his unassuming manner and great experience.—J. T. C.

THE ENTOMOLOGIST.

VOL. XXII.]

MARCH, 1889.

[No. 810.]

DESCRIPTION OF A NEW SPECIES OF *ARCTIIDÆ* FROM NEW ZEALAND.

By G. V. HUDSON.



METACRIAS STRATEGICA.

THE following species of *Arctiidæ* was taken, February 10th, 1881, by Mr. W. W. Smith, near the summit of the Richardson range, in South Canterbury, and not far from the town of Albury. It was beaten out of some plants of *Carmichaelia*, at an elevation of about 3000 feet, but further particulars relating to its habits are at present unknown; the only specimen as yet in collections being the one from which the accompanying description and drawing was taken.

I am indebted to Mr. Meyrick for informing me that the species is new, and also referring it to the correct genus *Metacrias*. He has likewise been kind enough to point me out the differences between this insect and the two others of the same genus, which I give briefly at the end of the description.

Arctia (Metacrias) strategica, n. s.

♂. Expanse of wings 17 lines. Antennæ dull yellow, with articulations marked in black. Head black, with a small tuft of ochreous scales in front. Legs ochreous, striped longitudinally with black. Thorax black, the margin of the prothorax indicated by a yellowish collar; mesothorax with a very broad yellow stripe on each side. Forewings, with costa, nearly

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straight, black, with six longitudinal ochreous lines; the first almost imperceptible, extending interruptedly only about one-sixth from hind-margin towards base; the second traversing the whole of the wing uninterrupted throughout, and broadest on disc, slightly curved downwards towards hind margin; the third much broken, and terminating at about one quarter from hind margin; also the fourth and fifth, which are, however, a little longer; the sixth very broad, extending from hind margin to base of the wing. Costa and inner margin edged with ochreous. Hind wings with a broad sub-marginal band of black, terminating shortly before anal angle, a large black dot being situated in the anal angle, yellowish ochre, tinged with red in the vicinity of the black band. Hind margin brilliant crimson, except at anterior angle, where black band extends to the edge of the wing; cilia of both wings ochreous. Abdomen black, with long ochreous hairs. Beneath, all the wings are yellowish ochre, with their margins broadly edged with black, and tinged with red near the edges. A conspicuous reddish stripe in the disc of each wing, and also a minute discal dot, which is quite invisible on the upper surface. Female unknown, but probably apterous.

This species chiefly differs from the two others belonging to the genus *Metacrias* in possessing the yellow collar, the absence of any large discal spot on both fore wings and hind wings, and the red colouring of the posterior margins of hind wings. The two other species (*Metacrias erichrysa*, Meyr., *M. huttonii*, Butler), are described by Mr. Meyrick, in the 'Proceedings of the Linnean Society of New South Wales,' 1886.

Wellington, New Zealand, November 8, 1888.

ON THE VARIATION OF INSECTS.

By T. D. A. COCKERELL.

(Continued from p. 29.)

1. Suffusion and Melanism.

Limenitis sibylla nigra, Entom. 1878, 101, quite black. (See also Newman, p. 67; and Ent. Mo. Mag., 1877, 89). *Melanargia galatea turcica*, B., Entom. 1878, 101, black, or nearly black. *M. galatea procida*, Hbst., "var. obscurior" (Staudinger). *Eupithecia albipunctata angelicata*, Prest, Barrett, Entom. xi. 170, with fig. *Vanessa cardui semisuffusa*, hind wings smoky. Entom. xi. 24. *V. cardui elymi*, Rbr., "maculis confluentibus." *Argynnis euphrosyne fingsal*, Hbst., "minor, obscurior" (Boreal Europe). *A. selene hela*, Stgr., "minor, supra obscurior" (Lapland, Siberia). *Pieris napi bryoniae*, Ochs., "ab. ♀ obscurior" (European Alps, Alaska). *Nemeophila plantaginis matronalis*, Frr., hind wings almost entirely black. *Callimorpha dominula persona*, Hb., hind wings dark. *Spilosoma fuliginosa borealis*, Stgr., smaller and rarer. *Hepialus velleda gallicus*, Ld., "♂ unicolor fuscus."

Cœnonympha davus, dark form in Shetland Isles, Newman Brit. Butt. 97. *Colias edusa suffusa*, Ent. xi., Newman Brit. Butt. 144. *C. philodice suffusa*, Massachusetts, Maynard, Butt. of New Eng., pl. vii., fig. 57c. *Pieris brassicæ nigrescens*, Newman Brit. Butt. 165. *Cirrhœdia xerampelina obscura*, Entom. xvi. 236. *Eubolia plumbaria nigrescens*, Entom. xvi. 138. *Melanthia albicillata suffusa*, Carrington. *Hybernia defoliaria suffusa*, Ckll. *Chelonia caia obscura*, Newman, Brit. Moths, 33; Entom. xi. 103. *Abraxas grossulariata obscura*, Newman, Brit. Moths, 100. See also Entom. 1887, 216, for a grey variety. *Melanippe hastata nigrescens*, tom. cit. p. 157. *Acronycta rumicis obscura*, id. p. 255; and *A. menyanthidis salicis*, Curt. *Xylophasia monoglypha nigrescens*, id. p. 285. *Satyrus alope maritima*, Edw., a small and dark maritime form (Long I. &c., United States). *Larentia olivata semisuffusa*, Proc. S. Lond. Ent. Soc. 1886, 53, pl. 1, fig. 1. *Amphidasys betularia doubledayiaria*, Mill. *Diurnea fagella*, melanic varieties now prevalent at Huddersfield, Ent. Mo. Mag. 1887, 140. *Anoplodera sexguttata niger*, Entom. x. 214. *Pterostichus cupreus niger*, Entom. xii. 110 (T. H. Hart). *Lema melanopa nigra*, and *L. cyanella nigrescens*, loc. cit. *Sphecodes gibbus niger*, ♂, and *S. ephippium niger*, ♂, near Hastings, Entom. xi. 17.—Melanism is a subject that comes up periodically and causes considerable discussion, but is nevertheless very far from being settled. I have expressed the opinion in a former paper that dampness in the atmosphere—clouds, mists, and so on—has a great deal to do with its production, yet I confess that it is probable that other factors are also at work. I have given a good long list above, but it really represents only a very small fraction of the known forms of this kind, and I have tried to make it as representative as possible. In connection with this list the following facts will be noticed:—

1. The small number of American examples: it appears certain that melanism as usually seen in Europe is rare in North America, a circumstance that is strongly against the theory of its being caused by cold. "A straw will show which way the wind blows," so it is interesting that, according to Mr. R. H. Meade, one of the chief points of difference between American and European species of *Sarcophaga*, is that in the former the anal segments are generally red or yellow, while in the latter they are black or grey. The species of this genus I have taken in Colorado have the anal segments red or reddish, confirming this statement.

2. The alpine forms: dark mountain varieties are well known throughout Europe. Mr. A. H. Swinton (Ent. Mo. Mag. 1885, 231) remarks on the melanic tendency exhibited by Asturian mountain insects, particularly the Orthoptera. Here in Colorado the species of *Colias* found high upon the mountains (10,000 ft. upwards) is of so much darker a yellow than the species occurring

lower down (8000 ft.), that I did not recognise it as belonging to the genus when on the wing.

3. Maritime melanism: Wollaston says that *Chrysophanus phlœas* is darker and more suffused in Madeira (where it cannot escape from the neighbourhood of the sea) than in England. *Aphodius plagiatus* usually has red dashes on the elytra on the Continent, but all those from Deal were perfectly dark, which indeed is the prevalent tendency with British specimens of this species ('The Variation of Species,' p. 61).

4. Melanism apparently confined to one sex: a further example of this is *Parnassius apollo hesebolus*, Nordm., which Staudinger describes as "v. major, ♂ albidior, ♀ obscurior."

5. The darkening is sometimes confined to the hind wings; examples are given in *Vanessa*, *Nemeophila*, and *Callimorpha*.

6. The recent development of a melanic race of *Amphidasys* in the manufacturing districts is well known, and from Mr. Porritt's remarks on *Diurnea* at Huddersfield, this seems to offer a similar case.

7. Northern melanic forms: it is an error, however, to suppose that all northern forms have a tendency towards melanism. Dr. F. Buchanan White, in an extremely interesting article (Ent. Mo. Mag. 1876, 145), gives a number of species which are generally or always "melanochroic" in Scotland, but also at the same time enumerates many examples of Scotch "leucochroism," showing that in a few species all the specimens are paler than in the south, while in others there is a general tendency that way. In America, *Terias lisa* is said to be paler in the north than in Florida.

ERRATUM.—Page 4, line 2 from bottom, for "*helice pallida*" read "*hyale pallida*."

(To be continued.)

A YEAR'S WORK IN PORTLAND.

BY MAJOR CHARLES E. PARTRIDGE.

(Concluded from p. 45.)

Uropteryx sambucaria flitted about over the blackberry bloom at night in great numbers. *Venilia macularia*, *Selenia bilunaria*, *Rumia luteolata*, *Boarmia repandata*, *B. gemmaria*, *Abraxas grossulariata*, *Larentia didymata*, *Melanthia ocellata*, *M. galiata*, and *M. fluctuata* occurred everywhere. *Odontopera bidentata*, *Hibernia rupicaprararia*, *Acidalia ochrearia*, *Asthena candidata*, *Acidalia rusticata*, *Ligdia adustata*, occurred very sparingly. *Acidalia degeneraria* came freely to light, as also did *A. remutaria*, *A. aversata*, and *A. marginepunctata*. *Gnophos obscuraria* swarmed at the blossom of wild sage, and *Larentia olivata* and *Anticlea rubidata*, though local, were easily obtained. Of *Melanippe*

rivata, *M. montanata*, *Acidalia subsericeata*, *Coremia ferrugata*, *C. designata* and *C. unidentaria*, *Anticlea badiata*, *Larentia multistrigaria*, *Hypsipetes sordidata*, I obtained but very few specimens, but *Acidalia bisetata* and *A. trigeminata* were very common.

Eupithecia pumilata and *E. rectangulata* occurred very commonly at blackthorn bloom. *E. coronata* on apple trees, and *E. absynthiata* and *E. vulgata* at light. *E. pimpinellata*, *E. castigata*, and *E. oblongata* were not uncommon. *E. isogrammaria* was scarce. *E. constrictata* when once found was fairly plentiful. *E. subnotata* common. Of *Triphosa dubitata* and *Cidaria prunata* I took but two specimens. *C. truncata*, *C. fulvata*, and *C. dotata* were equally scarce. *Camptogramma bilineata*, *Eubolia limitata*, and *E. bipunctaria*, were of frequent occurrence. *Anaitis plagiata* occurred but once.

Cledeobia angustalis, *Pyrausta purpuralis*, *Herbula cespitalis*, *Scopula olivalis*, and *S. prunalis*, occasionally occurred. *Ennychia cingulata* was both local and scarce.

Nomophila noctuella, *Scopula ferrugalis*, *Spilodes verticalis*, *Stenia punctalis*, *Pionea forficalis*, were generally distributed and common. *Eurrhypara urticata* occurred but sparingly. *Platytes cerussellus*, *Crambus pratellus*, *C. culmellus*, and *C. hortuellus* were a positive pest. Of *C. inquinatellus* I took but two specimens. *C. geniculeus* was fairly numerous. *Aphomia sociella*, *Oncocera ahenella*, *Ilithya semirubella*, *Ephestia elutella*, came to light, as also did *Rodophæa marmorea*.

Homæosoma nebulella produced but one specimen. *H. sinuella* and *H. binævella* were common, but *H. nimbella* not so much so. *Phycis ornatella* was not scarce. Of *Euzophera cinerosella* I took but one. *Scoparia cembræ* and *S. ambigualis*, occurred freely, but this year *S. mercurella* and *S. phæoleuca* and *S. angustea* were hard to procure.

Botys asinalis was not to be found in its usual haunts.

Tortrix podana, *T. ribeana*, *T. heparana*, *T. forsterana* were all very common. *Peronea variegana*, *P. aspersana*, were not very abundant. *Teras contaminana* plentiful. *Dictyopteryx holmiana*, *D. bergmanniana*, *D. forskaleana*, *A. conwayana*, *Spilonota trimaculana*, *Pardia tripunctana*, *Aspis udmanniana*, *Sericoris cespitana*, *S. urticana*, *S. lacunana*, *Cnephasia musculana*, *Sciaphila subjectana*, *S. virgaureana*, and *Sphaleroptera ictericana*, the same. *S. conspersana* more rarely met with. *Grapholitha trimaculana*, *G. nævana*, *Pædisca consequana*, *Ephippiphora cirsiiana*, scarce. *E. brunnichiana*, very plentiful wherever coltsfoot occurred. *Semasia wæberiana* not common, but *Catoptria ulicetana* and *C. cana*, very plentiful; as also was *Symæthis oxyacanthella*.

One specimen only of *Eupæcilia maculosana* occurred. *Catoptria pupillana*, *Conchylis francillana*, and *Xanthosetia hamana*, were almost as scarce.

Chrosis alcella occurred everywhere. *Tinea ferruginella*, *T. rusticella*, *T. tapetzella*, *T. lapella*, all occurred freely. *Fumea intermediella* was exceedingly common. *Lampronia quadripunctella*, *Swammerdamia combinella*, and *Psychoides verhuellella*, occurred sparingly. *Hyponomeuta padellus*, *H. cagnagellus*, *Plutella cruciferarum*, *Bryotropha terrella*, *B. desertella*, *B. umbrosella*, and *B. domestica*, were very common. *Depressaria yeatiana*, *D. nanatella*, *D. subpropinquella*, *D. heracleana*, and *D. applana*, were all more or less plentiful. I got a good series of *D. alstræmeriana* in my house, but found them nowhere else. Of *Lita marmorea* I obtained a few at light. *L. artemisiella* was scarce, as also were *L. atriplicella*, *Ptochenusa subocellea*, *Parasia carlinella*, *Endrosis fenestrella*, *Æcogenia quadripunctata*, and *Acrolepia granitella*, *Monochroa tenebrella*, *Argestria nitidella*, *Glyphipteryx thrasonella*, *Laverna epilobiella*, *Æcophora pseudospretella*, *Glyphipteryx fischeriella*. *Argyresthia mendica* occurred rather more commonly. *Elachista argentella* occurred everywhere, and *Argyritis pictella*, local but plentiful. *Hypsilophus schmidiellus* was to be found by diligent searching. *Lita leucomelanella* occurred here and there. *Coleophora discordella*, *C. cæspititiella*, *C. salinella*, *C. albitarsella*, all very common in the larva state; *C. troglodytella*, *C. gryphipennella*, and *C. argentula*, rather less so. *C. tripoliella* very scarce, owing to food-plant being so. Of the Pterophori I took eleven. *Platyptilia gonodactyla*, *Amblyptilia acanthodactyla*, *Oxyptilus parvidactylus*, *Mimæseoptilus pterodactylus*, fairly common. *Oxyptilus teuerii* this year was scarce. A few specimens each of *Mimæseoptilus bipunctidactylus*, *M. plagiodactylus*, *Pterophorus monodactylus*, *Acipitilia baliodactyla*, *A. pentadactyla*, and *Alucita hexadactyla*.

The Castle, Portland, November 10, 1888.

CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.

By J. W. TUTT, F.E.S.

(Continued from p. 43.)

Xylophasia, St., *rurea*, F.

Fabricius' description of the type is as follows:—"Noctua cristata, alis deflexis, griseo fuscoque variis, posticis fuscis; margine crassiori albo." "Caput fulvum, oculis atris. Palpi fusi apice albicantes. Thorax et abdomen cinerea. Alæ anticæ griseæ basi ad marginem crassiorem macula magna fusca, in qua maculæ ordinariæ. Pone hanc puncta tria parva alba marginis crassioris et aliquot fusca sparsa in disco. Margo denique et

macula ad angulum ani fusca. Posticæ supra fuscaæ margine exteriori et postico albidis. Subtus pallidæ puncto arcuque fuscis" ('Entomologia Systematica,' p. 618).

This is an exceedingly variable species, and the gradation and various phases of development as shown in its variation are very interesting. The variation strikes off in two distinct directions, both resulting in the production of distinct, almost unicolorous forms. The first group has the prevailing colours yellowish-ochreous and bright red, the second group has the prevailing colour brown. The first group appears to run from the type, with whitish-grey ground colour, to the var. *ochrea*, an ochreous-yellow form, with distinct red markings, through the var. *intermedia*, with red ground colour and distinct darker red markings, to *flavo-rufa*, an unicolorous form of a yellowish-red ground colour. The second group commences with the var. *putris*, of Hübner, of a dark ochreous ground colour, with deep red-brown markings, leading up to the *combusta* of Haw., a fuscous brown form, much clouded with darker, through the *alopecurus* of Esper, a deep reddish-brown form, with black costal streaks, and only the reniform marked, culminating in var. *nigro-rubida*, a deep reddish-black form, with no markings.

The type (grey form) is, perhaps, the rarest of all the different forms occurring in Britain. I have only specimens in my cabinet from Mr. Percy Russ, of Sligo, and from Rannoch, although Mr. Tugwell has informed me that it occurs in the Isle of Man. There is no doubt that this is the most beautiful of all the *rurea* varieties, some of the grey specimens having a peculiar glaucous tinge. This form is the *hepatica* of Haworth, and possibly the *hepatica* of Linnæus, although the latter is doubtful. Mr. T. Salvage writes:—"I took two very beautiful silvery varieties of this species (*rurea*) in Rannoch ten years ago, but have never seen the like before or since" (*in litt.*, '88). We thus have the following groups:—

- I. 1. *rurea*—the greyish-white type.
2. *ochrea*—yellowish ground colour, with typical markings.
3. *intermedia*—reddish ground colour, with typical markings.
4. *flavo-rufa*—unicolorous, yellowish-red specimens.
- II. 1. *putris*, Hb.—pale brownish-grey ground colour, with a dark brown central band.
2. *combusta*, Haw.—dark fuscous brown, with reniform outlined in white.
3. *alopecurus*, Esper—dark reddish-brown, with black costal streaks, and the reniform with black circumscription.
4. *nigro-rubida*—a deep, reddish-black, unicolorous form.

Of the varieties of this species from the Hebrides, Mr. J. Jenner Weir writes, "A very fine series was taken, showing a number of intermediate varieties between the type and the

variety *combusta*. It would be impossible to describe the rich chestnut colour of some of these most beautiful specimens, and in many instances the ground colour is in strong contrast to the dark markings" (Entom. xiv. 220).

α. var. ochrea, mihi.—The ground colour of the anterior wings of a clear yellowish-ochreous, the darker markings found in the type are all present, but much paler, and of a more distinctly red colour; a white dash on the inner margin near the anal angle, another on the inner margin just under the dark dash at the base of the wing. Thorax the same colour as the darker markings on the wings. Posterior wings pale grey, with dusky nervures; the lunule and base of the pale transverse line faintly discernible. This variety would include most of the pale forms captured in Britain and probably on the Continent. I have captured it in many localities in Kent, and have received it from almost all parts of Britain, including the Orkneys, Hebrides, and the West Coast of Ireland.

β. var. intermedia, mihi.—The ground colour of a clear reddish-ochreous, the dark markings of the type being clearly developed in a darker shade than the ground colour. The stigmata rather indistinct, owing to the deeper ground colour. The pale transverse line on the posterior wings is more distinct than in the type. This is a form distinctly intermediate between *var. ochrea*, and *var. flavorufa*. It has all the distinct markings of *ochrea*, but the reddish ground colour of *flavo-rufa*. This form occurs with the type, but appears to be rare. I have seen but few specimens, and am indebted for those I have to Messrs. Rose and Harrison, of Barnsley, and Mr. Boulton, of Hull. It is recorded from Derby by Mr. Hill, in the 'Entomologist's Monthly Magazine,' vol. xxiii. p. 6. This is the *var. β* of Guenée's 'Noctuelles,' vol. v. p. 138, but it is uncertain whether it is the *La Bigarree*, of Engramelle. Guenée says of his *var. β*:—"All the markings reappear, even the ordinary lines which are obliterated in the type. The ground colour is reddish-brown, mixed with yellow-ochreous and whitish." In Humphrey and Westwood's 'British Moths,' vol. i. p. 159, we find, "Varieties occur, with the ground colour of the fore wings bright ochre-red, with the stigmata distinct."

γ. var. flavorufa, mihi.—The ground colour of a dull yellowish-red tint, and so far resembling *var. intermedia*, but the typical markings almost entirely obsolete and lost in the ground colour. Both stigmata very distinct and outlined in yellow; some short yellow dashes along the costa (the remaining parts of the obsolete line); a yellow patch at the costal base, and a few yellow scales on the outer part of the otherwise dusky nervures, are the only markings on the anterior wings of this otherwise unicolorous variety. My specimens have come from Rannoch, Barnsley, Glasgow and Ripon.

δ. var. putris, Hb.—The *putris* of Hb., fig. 241, is without doubt a *var. of rurea*. It may be described as, "Anterior wings of a pale brownish grey, base paler, with a much waved, transverse, basal line; a longitudinal pale orbicular, and a reniform outlined in pale; a distinct transverse black wavy line beyond the reniform. Between this and the basal line the colour is dark brown, a black line passing through this darker part between stigmata, from costa to inner margin. A row of dots parallel to the hind margin; extreme hind margin dotted; hind wings dark grey, base paler, dark transverse line and dark lunule." This description of Hübner's

figure satisfies precisely the description of some of the beautiful forms brought by Mr. Salvage from the Isle of Lewis in 1887. From a figure kindly lent me by Mr. Mosley, of Huddersfield, this would appear to be the var. *borealis* mentioned by Mr. Porritt in his 'List of Yorkshire Lepidoptera,' p. 73, where he says, "Mr. S. L. Mosley says the varieties *alopecurus*, Esp., and *borealis*, also occasionally occur at Huddersfield." With reference to this var. *borealis*, Mr. Mosley, in September, '88, wrote:—"I only know the variety *borealis*, by Mr. Bond having pointed out one in his cabinet with the remark, 'That is var. *borealis*!' I took one like his specimen here, of which I send you a drawing." This drawing represented without doubt Hubner's *putris*. In Humphrey and Westwood's 'British Moths,' vol. i. p. 159, there is a remark about *borealis* as follows:—"As Mr. Curtis gives the *putris* of Hübner as probably identical with his *Xylyna borealis*, and as Boisduval gives *putris* as a variety of *rurea*, Mr. Curtis's insect is, probably, a variety of this species." Of this, I think there is now no doubt. I have only seen British specimens of this var. from Lewis, but Mr. Mosley's figure proves it to occur at Huddersfield.

α. var. *combusta*, Haw.—Haworth's description of this variety is as follows:—"Alis fusco-brunneis obsolete nebulosis, figura 3 vel 5 medio notatis." "In medio anticarum alarum stigmata ordinaria obsoleta, albido marginata, anticum ovale antrorsum valde inclinante; exterius auriforme margine albo interrupto et inde representat figuram 3 vel 5. Posticæ alæ fuscæ ciliis subflavicantibus." This variety is generally considered as synonymous with *alopecurus*, Esper, by Continental authors; but Newman, in his 'British Moths,' p. 283, points out the following phrase in Haworth's description, "fusco-brunneis et stigmata ordinaria albido marginata," which he says is not applicable to var. *alopecurus*. I quite agree with this and hence have separated them. I have no dark specimen with the stigmata outlined in white, but I do not doubt, but that specimens occur in some cabinets.

ζ. var. *combusta* of Hübner (fig. 366) is different to the above. It has the anterior wings, with an almost typical, reddish-brown costa, with pale costal streaks and distinct stigmata, outlined in paler, but with the lower half of the wings unicolorous, dark, reddish-brown. Hübner's *combusta* seems a combined form of var. *intermedia* (costal half of wings), and var. *alopecurus* (inner marginal half of the wing). This appears to be the nearest approach to the dark forms generally obtained in Britain. Guenée refers *combusta*, Hb., to *alopecurus*, Esp., an evident error. His description, too, of *alopecurus*, Esp., 'Noctuelles,' vol. v. p. 138, is more like Hübner's *combusta* than Esper's *alopecurus*. Guenée writes, "The ground colour of the anterior wings entirely of a deep, red-brown colour, with some bright marks on the costa, and the outside of the reniform surrounded by yellow. Fringe of the four wings equally brown, with some yellow streaks on the superiors, and a reddish line in the inferiors. Females still darker."

η. var. *alopecurus*, Esp.—From the *alopecurus*, Esper, Plate cxlvii, fig. 3, I made the following description:—"The anterior wings of a dark reddish-brown, with five strong, black, costal streaks, no orbicular, large reniform of the ground colour, with black centre and black circumscription, three white dots on costa near apex, three parallel to hind margin near apex, three tiny white dots at anal angle, nervures black. Hind wings dark grey, with blackish nervures and lunule. Very few British specimens, I believe, will answer to this description of *alopecurus*. Guenée says of

alopecurus, Esp., "the exterior outline of the reniform yellowish." This is evidently incorrect of Esper's figure. Newman says, "uniform red-brown, the reniform spot being indicated by a pale line, and a few other darker and paler dots scattered over the wing" ('British Moths,' p. 283). Dr. Staudinger, in his 'Catalogue' says of this variety, "al. ant. unicolor, brunneis."

♂. var. *nigro-rubida*, mihi.—The most extreme melanic form of the species, of a most intensely blackish-red or blackish-brown colour; no pale streaks on the costa, and perfectly unicolorous, with the exception of a faint trace of the outline of the orbicular and the outer edge of the reniform. Hind wings dark grey, nervures more dusky. Thorax of the same dark colour as the anterior wings. The type of this variety was captured in Lewis in 1887. I have only seen specimens of this variety from the Hebrides.

(To be continued.)

NEW SPECIES OF DELTOIDS AND PYRALES FROM COREA, NORTH CHINA, AND JAPAN.

By J. H. LEECH, B.A., F.L.S., &c.

(PLATES II., III., & IV.)

THE identification of species of these obscure groups is a matter of difficulty. The existing descriptions and figures are not always easy to make out, and it is almost a necessity to compare the specimens with the original types, which latter are often in a very inferior condition. In one season's collecting I took over four hundred species of the above groups, which I have carefully compared with the types in Dr. Staudinger's, Mr. Moore's, and the national collections.

HYPENA COREALIS, n. sp., Plate II., fig. 1.

Cinnamon-brown. Primaries with a slender basal patch of darker brown, reniform represented by a square grey blotch, and the orbicular by a black dot; a broad angulated dark band, bordered internally by a blackish line and externally by a greyish white line; traverses the disc of the wing, a faint wavy submarginal line preceded by a greyish patch on the costa, a dark apical streak. Secondaries traversed by a dark basal and a pale central line; three black dots on inner margin towards anal angle. Under surface fuscous-grey, with the markings of the upper side reproduced. Expanse, 29 mm.

One of each sex taken by myself at Gensan in July, 1886.

HYPENA SATSUMALIS, n. sp., Plate II., fig. 13.

Primaries dark brown, sprinkled with grey on the basal and outer marginal areas, a narrow oblique white line beyond the middle of the wing, and a submarginal wavy whitish line commencing as a broad streak at apex. Secondaries fuscous-brown. Under surface fuscous; secondaries and apex of primaries sprinkled with darker scales. Expanse, 23—27 mm.

Nearest allied to *Hypena indicatalis*, but the transverse line of

primaries is not angulated as in that species, and it has no white discal spot.

Five examples taken by myself in Satsuma, May, 1886.

HYPERA RUSTICALIS, n. sp., Plate II., fig. 12.

♂. Primaries brown, thickly sprinkled with fuscous scales, and tinged with pink; slightly oblique central and submarginal lines blackish; fringes brown interlined with blackish. Secondaries dark fuscous-brown. Under surface of primaries fuscous-brown; secondaries paler, discal spot black, dark central line on each wing. Expanse, 28 mm.

One male example taken by myself at Hakodate in August.

HYPOEPA BAMBUSALIS, n. sp., Plate II., fig. 2.

♂. Primaries purplish brown, with a discal and marginal golden brown suffusion; a transverse bidentate white line divides the wing into equal parts, the basal half being darker; before the outer margin is a transverse dark shade. Secondaries fuscous. Under surface fuscous, primaries with some greyish scales towards apex, and an indistinct dark central line; discal area of secondaries greyish. Expanse, 32 mm.

One male example taken by myself at Foochau in April, 1886.

CAPNODES GENSANALIS, n. sp., Plate II., fig. 9.

Violet-grey. Primaries with a small brown spot at base of costa, followed by a broad brown band edged externally by a narrow white line, two indistinct parallel wavy lines cross the disc of the wing, and beyond these is a white elbowed line edged internally with blackish and externally with brown; reniform faintly outlined, except on its external edge, which is bordered with blackish, and precedes a brownish patch, orbicular black and dot-like; marginal area suffused with brown, a series of black spots on the margin itself. Secondaries with a black discal spot, white central line and black marginal spots as on primaries. Under surface yellowish grey; primaries suffused on disc and outer margin with reddish; central line, discal and marginal spots on all the wings black. Palpi, head, and thorax reddish brown. Expanse, 38 mm.

A single specimen taken by myself at Gensan, Corea, in July.

ZANCLOGNATHA LINEALIS, n. sp., Plate II., fig. 4.

Primaries pinkish buff, with a minute discal spot, and a straight narrow brown submarginal band faintly bordered externally with whitish. Secondaries pale brown. Under surface pale fuscous-brown, secondaries rather paler. Expanse, 35 mm.

One male example in Satsuma, and a female specimen at Nagasaki, taken by myself in May, 1886.

ZANCLOGNATHA OBLIQUALIS, n. sp., Plate II., fig. 5.

♂. Greyish brown tinged with violet; basal line nearly straight, central line angulated just below costa both blackish, in the enclosed area is a brownish fascia terminating before the costa; a brown submarginal band, edged externally with white, runs from apex in an oblique direction to the inner margin. Secondaries with an indistinct blackish central line; submarginal band sharply angulated before reaching the inner margin, and attenuated towards costa. Under surface fuscous-brown, discal areas of all

the wings rather paler, primaries traversed by one and secondaries by two blackish lines. Expanse, 22 mm.

One male example taken by myself at Foochau in April.

HERMINIA FASCIALIS, n. sp., Plate II., fig. 3.

♂. Pale brown, with a faint pinkish tinge. Primaries with an indistinct dark basal band; all the wings traversed by a narrow white submarginal band, broadly bordered internally with olivaceous-brown, which colour is continued to apex of primaries. Under surface greyish brown, with whitish submarginal lines and faint discal spots. Expanse, 28 mm.

One male taken by my native collector at Hakodate, July, 1887.

HERMINIA NINGPOALIS, n. sp., Plate II., fig. 7.

Fuscous-brown. Primaries with the small orbicular and large reniform stigmata yellow, outlined with dark brown; transverse basal and discal lines wavy dark brown, pale submarginal line edged internally with dark brown. Secondaries with two parallel dark brown lines traversing the disc of the wing. Under surface rather darker than above, a small discal spot, a narrow dark discal band, and a pale submarginal line. Expanse, 33 mm.

Five examples taken by my native collector in the Snowy Valley, near Ningpo, in July, 1886.

HARMATELIA BIFIDALIS, n. sp., Plate II., fig. 11.

Basal two-thirds chocolate-brown, outer third brownish buff, clouded along hind margin and towards apex with darker brown; the dividing line is blackish edged with whitish, and sharply toothed below its middle, a dark transverse wavy line towards base, and a discal series of black dots forming an indistinct Δ . Secondaries fuscous, paler towards costa. Under surface fuscous, secondaries with a darker central line. Expanse, 23 mm.

An example of each sex taken by myself at Hakodate in August.

CALOBOCHYLA BILINEALIS, n. sp., Plate II., fig. 14.

♂. Primaries greyish brown, with a few dark apical spots, and traversed by two reddish brown lines, the basal internally and the discal externally bordered with orange; between these lines are two small reddish brown spots. Secondaries pale brown, broadly bordered on outer margin with fuscous. Under surface of all the wings yellowish brown, primaries with discal spots, broad band along outer margin, and fringes blackish. Palpi, head, and collar reddish orange. Expanse, 36 mm.

One male example taken by my native collector in the Snowy Valley, July, 1886.

PLATYJA NUBIFERALIS, n. sp., Plate II., fig. 8.

Golden brown, with a purplish discal suffusion. Primaries traversed by three dark serrated lines, each commencing in a brown quadrate spot on costa. Secondaries paler towards costa, traversed by two dark central lines; submarginal line darker brown, with an external purplish edging. Under surface yellow clouded with fuscous, except at costa and apex. Expanse, ♂ 45 mm., ♀ 47 mm.

I took an example of each sex in Satsuma, May, 1886, and a female specimen at Nagasaki in June of the same year.

MESTLETA ALBICOSTALIS, n. sp., Plate II., fig. 10.

Violet-grey. Primaries with a broad whitish stripe clouded with greyish occupying the whole of the basal and a large portion of the costal areas, but not extending to the apex; the apical third is chocolate-brown clouded with darker, a faint basal line, whitish elbowed and bidentate submarginal line; fringes dark grey, narrowly chequered with whitish, and with one brown patch about the middle. Secondaries with whitish basal patch, brown linear discal spot, angulated and indented blackish central line, a large blackish spot with some blackish scales on each side at anal angle, and a marginal series of small black spots; fringes grey. Head brownish grey, thorax white, as also is the abdomen, except dorsal portions of segments 8, 9 and 10. Under surface of primaries fuscous-grey, the outer margin paler, with a series of black dots; secondaries whitish-grey, fuscous towards costa and outer margin, with central line and marginal spots as above. Expanse, ♂ 22 mm., ♀ 25 mm.

Four specimens taken by my native collector at Ningpo in June and July, 1886, and one ♀ example by myself at Foochau in April.

MESTLETA LUTEFASCIALIS, n. sp., Plate II., fig. 15.

Greyish brown. Primaries with a blackish discal line, marginal line and faint discal spot. Secondaries suffused with reddish brown about the disc, and with a pale yellow central band formed of irregularly placed confluent spots; discal spot and marginal line black. Under surface: primaries dirty grey, with faint transverse band; secondaries paler, with dark central band and discal spot. Expanse, ♂ 19 mm.

A male example taken by myself in Satsuma in May, 1886.

MERANDA TRISTALIS, n. sp., Plate II., fig. 6.

Greyish brown. Primaries traversed by a central line starting from the costa, elbowed towards the apex, and then descending to inner margin; a pale yellow apical mark and a few white streaks on the costa. Under surface fuscous-brown, discal area of secondaries rather paler. Expanse, 19 mm.

One male specimen taken by myself in Satsuma, May, 1886.

COPTOBASIS SEGNALIS, n. sp., Plate IV., fig. 4.

Brownish black, with a pale yellow discal spot and wavy central band on each wing. Under surface as above, but markings not so distinct. Pectus, abdomen beneath, and legs whitish. Expanse, 22 mm.

I took this species at Nagasaki in June, and Gensan in July. I have also received it from Ningpo and Yokohama (Manley).

HELIOTHELA NIGRALBATA (Warren MS.), n. sp., Plate IV., fig. 7.

Fore wings brown-black; hind wings velvety black: the former with a whitish spot on the costa before the apex; the latter with a bright white spot in the centre: both these spots show through on the under side. Head, thorax, abdomen, under side of wings, and fringes, brown-black. Expanse, 13 mm. Hab. Chekiang; one specimen.

An example in Mr. H. Pryer's collection without locality, but probably from Yokohama.

ENDOTRICHA BICOLORALIS, n. sp., Plate IV., fig. 17.

♀. Primaries reddish buff, costa spotted with darker; outer third purplish, the pale yellowish line of division is nearly straight, and projects

slightly into the darker portion about the middle, black discal spot. Secondaries purplish, irrorated with black, and the disc traversed by two parallel pale lines. Fringes of all the wings grey-brown, preceded by a black marginal line. Under surface as above. Expanse, 15 mm.

I took a female example at Gensan in July, 1886.

MICROSCA EXUSTA var. *ERECTA*, Plate IV., fig. 3.

♀. Yellowish ochreous, reticulated with purplish brown. Primaries have a purplish brown stripe from the apex along the costa nearly to the middle, from whence it traverses the wing directly to the inner margin; from the costal portion of this stripe a line of the same colour is projected to the outer margin. Secondaries with curved central, and indented submarginal purplish brown lines. Expanse, 22 mm.

A female example taken by myself at Gensan, July, 1886.

The narrower straight-edged central fascia would appear to afford a good character by which this insect might be specifically separated from *C. exusta* and *ardens*, but I have long series of each of these last, and am of opinion that they themselves are nothing but forms of one species. I am therefore not inclined to claim specific rank for the solitary specimen I have from Gensan, which, although it exhibits some points of difference when compared with typical examples of *C. exusta*, Butl., taken at the same time and place, is yet connected with that species by other forms taken in Japan, which are not exactly identical with typical *C. exusta* or var. *ardens*.

MICROSCA MARGINEPUNCTALIS, n. sp., Plate IV., fig. 10.

Primaries fuscous-grey, discal area tinged with pink, costa spotted with brown, three black spots below the tip, and some pale cuneiform spots on outer margin; several dusky lines from inner margin to the median nerve, discal spot black. Secondaries pinkish grey, with some small whitish discal spots separated from each other by blackish scales, two interrupted transverse abbreviated whitish bands from abdominal margin. Under surface pale brown, faintly tinged with pink; primaries thickly spotted with black along costal area, some short blackish linear marks on the disc, and some silvery white cuneiform streaks at apex and outer margin; secondaries with the discal area densely sprinkled with black scales, and divided into three portions by transverse bands of the ground colour. Expanse, ♂ 22—28 mm., ♀ 31—33 mm.

I took four specimens (one male, three females) in Satsuma, May, 1886.

MICROSCA SUBROSEALIS, n. sp., Plate IV., fig. 14.

Primaries ochreous, strongly suffused with pink, and traversed by several faint narrow brownish wavy lines, one of which beyond the blackish discal spot is sharply elbowed; costa rather paler, spotted with linear patches of brown. Secondaries pinkish red tinged with ochreous, and sprinkled with numerous faint dots arranged in transverse lines. Fringes pale brown, chequered with dark brown. Under surface pale ochreous, tinged with pink and dotted and lined with brown. Expanse, 20 mm.

An example of each sex taken by my native collector at Ningpo, in June, 1886.

DIASEMIA DISTINCTALIS, n. sp., Plate IV., fig. 5.

♂. Blackish brown. Primaries with a wedge-shaped white mark about the centre of the wing, beyond which is a white spot near the costa, a white basal line, and deeply indented central line, with a white interrupted sub-marginal band. Secondaries with a broad white central band bordered with black, which again is outlined by a whitish line; submarginal line white, interrupted; fringes chequered. Under surface as above, but paler. Expanse, 19 mm.

This species was taken by my native collector in the Snowy Valley, near Ningpo, in July, 1886.

BOTYS LUGUBRALIS, n. sp., Plate III., fig. 6.

Brown, with a slight cupreous tint. Primaries with a dark basal line; stigmata darkly outlined, beyond them is a sharply serrated dark line, which curves abruptly towards the centre of wing, then descends to the inner margin. Secondaries with a dark central line and discal spot. Under surface the same as upper; disc of primaries darker. Expanse, 27 mm.

This species is allied to *Botys tristrialis*, Brem., but is smaller, and the central line of secondaries is not angulated. I took this insect in August, 1886, at Hakodate, Nemoro, and at Shikotan, Kurile Islands.

BOTYS MACULALIS, n. sp., Plate III., fig. 11.

Primaries blackish, with a pearly gloss; there are six pale yellow markings on the disc, the two nearest the base are oblong, placed one over the other, and separated by the median nerve, the lower is followed by a smaller triangular-shaped mark, one beyond and nearer the costa is a large irregular shaped patch, and two small spots placed colon-like under the costal nerve. Secondaries pale yellowish, traversed by central, sub-marginal, and marginal blackish bands; a projection from the internal edge of the submarginal extends almost to the central band, and the opposing edges of the marginal and submarginal bands are in contact at the anal angle, and again about the middle. Under surface: primaries paler than above, the three spots nearest the base confluent. Secondaries pale yellowish grey, with an indented and angulated transverse brown line. Expanse, 34 mm.

Of this distinct species I took one not very good male example at Tsuruga in July.

BOTYS GLADIALIS, n. sp., Plate III., figs. 5 ♂, 15 ♀.

♂. Greyish brown. Primaries tinged with ochreous, a small blackish discal spot, and a dark curved and indented central line. Secondaries paler towards abdominal margin, a dark curved central line terminates just above anal angle; fringes of all the wings fuscous. Under surface pale shining brown, tinged with fuscous, but without markings of any kind. Palpi, head, and thorax colour of primaries, body darker brown above, whitish beneath. Expanse, 27 mm.

♀. Ochreous brown, with a small blackish discal spot, and indications of a dark curved and indented central line on the primaries, there are also indications of a central line on secondaries; fringes of all the wings fuscous-brown. Under surface pale ochreous-brown, without markings of any kind. Expanse, 26 mm.

One example of each sex taken by myself at Foochau in April, 1886.

BOTYS FUSCOMARGINALIS, n. sp., Plate III., fig. 4.

Pale straw colour, clouded with fuscous-brown, especially on the outer margins of all the wings. Primaries: basal line, which is curved and slightly angulated near the costa brown, as also are two discal spots, and the elbowed and sharply angulated central line. Secondaries with two brown lines, the basal slightly curved and interrupted, the central twice angulated, and terminating before the inner margin. Under surface similar to above but lines less distinct. Expanse, 29 mm.

One example taken by myself at Hakone in August, 1886.

BOTYS MANDARINALIS, n. sp., Plate III., fig. 14.

Golden yellow. Primaries broadly bordered on the costa and outer margin with brownish purple, stigmata represented by a dark dot, followed by a <-shaped mark, a dark basal band, a short wavy line running from the middle of inner margin to the centre of wing, and a short line descending from the costa, near the apex. Secondaries paler about the disc, with a short dark central band, and broad brownish purple outer marginal band, which latter does not reach the anal angle. Under surface paler, legs and pectus white, palpi brown, fringes golden yellow. Expanse, ♂ 29 mm., ♀ 28 mm.

I took this species at Nagahama and Tsuruga in July, 1886, and also received it from my native collector. Ningpo, July.

BOTYS INORNATILIS, n. sp., Plate III., fig. 13.

Pale straw colour, with a slight tinge of grey, very silky, entirely without markings, fringes silky white. Under surface more dusky, especially about the disc of primaries, and with a faint central band. Expanse, ♂ 30 mm., ♀ 31 mm.

I took a male in Satsuma in May, and a female at Sakata in August.

BOTYS CURVALIS, n. sp., Plate III., fig. 3.

♂. Pale ochreous brown; primaries with a slightly oblique basal line, a discal spot, and a submarginal line, the latter starting from the costa runs first in the direction of the outer margin, then curving inwards descends below the centre of the wing, where it again changes its course, and falls vertically, terminating on the middle of the inner margin. Secondaries with an undulated dark central line. Fringes rather darker. Under surface: primaries fuscous-grey, secondaries paler; discal spot and lines as above. Expanse, 30 mm.

Allied to *B. damoalis*, but can be separated at once from that species by the different character of the submarginal line of primaries, and central line of secondaries.

One male taken by native collector at Ningpo in June.

BOTYS NINGPOALIS, n. sp., Plate III., fig. 1.

♂. Primaries fuscous-brown; a pale yellow quadrate spot about the middle of wing towards costa, followed by a large irregular-shaped blotch of the same colour, beyond which are two colon-like dots; central portion of costa orange. Secondaries fuscous-brown, rather paler along inner margin. Under surface a paler reproduction of upper. Anterior tibiae yellow. Expanse, 32 mm.

A single male example taken in the Snowy Valley, near

Ningpo, by my native collector in July, 1886. Dr. Staudinger possesses an unnamed specimen of this species from Amurland.

BOTYS LACRYMALIS, n. sp., Plate III., fig. 12.

Primaries brown with violet reflections; dark angulated and slightly oblique discal and elbowed central lines, the latter bordered externally by an indistinct pale band; discal spot black. Secondaries pale shining brown, with a darker curved central line, outer margin broadly bordered with violaceous brown. Fringes grey-brown. Under surface pale shining brown, discal spot black, costal area and outer margin of primaries broadly violaceous brown, a narrow streak of the same colour along the costal portion of the outer margin of secondaries. Expanse, ♂ 28 mm., ♀ 32 mm.

I took specimens in Satsuma in May, and at Nagasaki in June.

BOTYS PACALIS, n. sp., Plate IV., fig. 15.

♀. Primaries dark reddish brown, with a black basal line and discal spot; a pale dentate submarginal line internally bordered with black, terminates before reaching the inner angle. Secondaries fuscous-brown, with an indistinct central band; under surface fuscous-brown, with darker central line, discal spots paler outlined with blackish. Expanse, 23 mm.

I took one female example in the Snowy Valley, near Ningpo, in April, 1886.

BOTYS GENIALIS, n. sp., Plate III., fig. 10.

♂. Primaries dull orange, with a darker discal spot and curved central band; fringes dusky. Under surface the same as upper but duller; legs, pectus, and palpi, white.

♀. The same as male, but secondaries suffused with fuscous and under surface decidedly darker. Expanse, ♂ 22 mm., ♀ 21 mm.

I took this species at Nagasaki and in Satsuma in May and June, and also received it from Ningpo (Nat. Coll., June).

BOTYODES AUREALIS, n. sp., Plate III., fig. 7.

Golden yellow without any trace of markings; secondaries subhyaline. Legs and pectus white. Expanse 32 mm.

I took a specimen of each sex at Nagasaki in May, 1886.

BOTYODES PRINCIPALIS, n. sp., Plate III., fig. 9.

Crocus-yellow. Primaries with two series of blackish spots, indicating interrupted basal and central lines, stigmata blackish; two brown confluent patches, one situated at inner angle, and the other about the centre of outer margin. Secondaries with a black interrupted central band, and discal spot; a wavy brown submarginal band, and a brown patch at outer angle. Under-surface paler yellow, the only markings being the brown marginal patches. Legs white, except the anterior femora. An intensely black silky tuft at base of abdomen. Expanse, 43 mm.

A single specimen taken in Satsuma by myself, May, 1886, and several examples collected for me at Ichang, Central China, by Mr. Pratt, in August, 1888.

GLYPHODES BIPUNCTALIS, n. sp., Plate III., fig. 2.

Primaries brown, with a slight purple reflection; on the disc of the wing are two round white spots, bordered by a darker shade of the ground colour, the smaller of the two being nearest the base of wing. Secondaries light brown, subhyaline, with a dark central line; outer marginal area of the wing darker than the rest. Under surface a paler reproduction of upper. Legs whitish, except anterior femora, which are brown. Expanse, ♂ 30 mm., ♀ 24 mm.

I took a fine series of this species in May, 1886, at Nagasaki and in Satsuma. I have also received it from Gensan, Corea.

CATAPROSOPUS PAUPERALIS, n. sp., Plate IV., fig. 11.

♂. Light brown, sprinkled with darker scales, and having a purplish reflection. Primaries darker brown along the basal portion of the costa, wing traversed by curved basal and wavy central lines; fringes chocolate brown. Under surface; colour much the same as above, with a dark discal spot and faint reddish central line; head and palpi chocolate brown. Expanse, 26 mm.

This species was sent me by Mr. Manley, who took it in the neighbourhood of Yokohama.

SAMIA FUMIDALIS, n. sp., Plate IV., fig. 8.

♂. Primaries yellow, much clouded about the costa and outer margin with fuscous-brown; basal and deeply elbowed central lines blackish. Secondaries yellow, clouded with fuscous-brown towards the outer margin, and with a blackish, deeply elbowed central line. Under surface pale whity-brown, clouded about the disc of primaries with fuscous-brown, discal spots and central line darker. Expanse, 21 mm.

I took this species at Nagasaki in May, 1886.

POLYTHLIPTA LIQUIDALIS, n. sp., Plate III., fig. 8.

Hyaline with pearly reflections. Primaries with the base blackish, a broad streak of pale chestnut along the inner margin, turns upwards abruptly, and terminates in a black curve before the inner angle, a wedge-shaped band bordered with black runs from costa and joins the inner marginal streak before the base; occupying the apical area is a large patch of dark brown clouded with blackish, and enclosing a white subcostal spot; stigma pale chestnut. Secondaries with a blackish discal spot, and row of four spots along the outer margin, the 1st and 4th being much the largest; at outer angle is a pale brownish blotch, internally bordered with black, and preceded by a blackish streak. Abdomen pale chestnut, legs white. Expanse, 44 mm.

I took one ♂ example of this remarkable species at Gensan, Corea, July, 1886.

CATACLYSTA PRODIGALIS, n. sp., Plate IV., fig. 16.

♂. Primaries chocolate brown, a large white patch on the inner margin, a white basal line followed by a white central line curving abruptly to the centre of the wing, then sharply to the inner margin, submarginal band white, margin orange bordered by narrow black lines. Secondaries white with broad blackish brown basal and submarginal bands traversed by yellow lines, margins orange bordered by narrow black lines; under surface similar but paler. Female rather darker than male. Expanse, ♂ 11 mm., ♀ 12 mm.

I took a nice series of this species at Gensan in July, also a specimen at Tsuruga in the same month.

HYDROCAMPA INTERRUPTALIS, Pryer, v. *separatalis*, Plate IV.,
figs. 2 & 13.

a. Colour and markings similar to the type, but on the secondaries the black lines, which in the type form the external border of the white discal spots, and traverse the wing from costa to abdominal margin, are in this form absent in the area between the spots. Under surface darker, markings as above (fig. 2).

β. Markings as in var. *a*, but the ground colour is chocolate brown. Expanse, 19—21 mm. (fig. 13).

I took a specimen at Ningpo in April, and several, including both sexes and the brown form at Gensan, in June, 1886.

LEPARODES FLORALIS, n. sp., Plate IV., fig. 1.

♂. Whity-brown; angulated basal, central, and submarginal lines of primaries whitish edged with brownish; a white line parallel with outer margin broken up into spots, each of which is edged externally with black. Secondaries pinkish towards outer margin, with two central, transverse, brownish edged, white lines, and a marginal series of white spots, edged externally with black. Under surface, fuscous-brown markings similar to upper side but less distinct. Expanse, 17 mm.

I took a ♂ example at Tsuruga, and one at Fushiki in July.

DESMIA SODALIS, n. sp., Plate IV., fig. 6.

Fuliginous black. Primaries with a quadrate white spot on disc, followed by a wavy whitish yellow submarginal line, commencing at the costa in a wedge-shaped mark, a yellow spot on the outer margin close to inner angle. Secondaries with a white central band, which widens out into a blotch about the centre of the wing. Under surface the same; pectus yellowish, antennæ tipped with yellow, body with three white bars at base, and a broader yellow bar near the extremity. Expanse, 20 mm. The sexes do not differ.

I took this species in Satsuma, May; Nagasaki, June; and received it from Mr. Manley, Yokohama; and Ningpo (Native Coll.). There is an unnamed example of this species in the National Collection from Chekiang.

ZEBRONIA ORNATALIS, n. sp., Plate IV., fig. 12.

♂. White; primaries with three black spots, one of which is on the costa near the base; another on the disc, with one just below it near the inner margin; a black central line commencing as a spot on the costa, submarginal and marginal lines also black. Under surface white sprinkled with darker towards costa, markings as above but very indistinct. Expanse, 17 mm.

Three examples taken by my native collector at Ningpo in June, and one specimen by myself at Foochau in April.

ORYBA REGALIS, n. sp., Plate IV., fig. 9.

♂. Flame red. Primaries more crimson about the costal and basal areas; a large lemon-yellow spot bordered with black, and with an indentation on its outer margin, is situated just beyond centre of costa, from the extremity of this spot a red line descends to inner margin. Secondaries with a slight trace of a red central band. Under surface more dusky than upper surface. Expanse, 31 lines.

I took a single male at Gensan, Corea, in July, 1886.

12, Prince's Street, Hanover Square, W.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

LATE APPEARANCE OF GONOPTERYX RHAMNI.—Referring to the late appearance of insects last year the following note may be of interest:—"On Sunday, October 28th, on the common near here, a male specimen of the above insect was taken in good condition having apparently only recently emerged. The day was bright and warm.—A. DRUITT; Chapel Street, Berkhamsted. [This species has been noted flying on warm days in the South of England at a later period than that above given.—ED.]

ANTHOCHARIS CARDAMINES AND VANESSA URTICÆ (VARs.).—I have received from Thame (Oxfordshire) a female *A. cardamines*, with an orange splash on the left fore wing. A similar marking also occurs on the right upper wing, but only on the under side. The *V. urticæ* was bred with a large number of others. It is similar to the fourth figure in Newman's. The specimens were taken and bred respectively by a lady, who was struck by their abnormal appearance.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnerstury, W., January 12, 1889.

VARIETIES OF COLIAS EDUSA.—In reply to Mr. T. D. A. Cockerell's note (Entom. 13) with reference to my notice of the capture of a "primrose coloured" *Colias edusa*, var. *helice* (Entom. xxi, 272), I would say that by this description I did not at all mean to suggest that the specimen is as yellow as our own *Colias hyale*, or the North American *Colias philodice*; but I think I may safely describe it as being in tint mid-way between these species, and the European *Colias phicomone*. It is often exceedingly difficult to give an accurate name to shades of colour, perhaps the definition of this as "light straw" would be preferable. Besides there are primroses and primroses, and when I wrote I had not in my eye the "yellow primrose" of the poet "by the river's brim," newly expanded, but one full-blown and somewhat bleached by exposure to sun and weather. In the season of 1877, when *Colias edusa* was so extraordinarily abundant in this country, it was my fortune to set more than fifty of the variety *helice*, of Haworth, taken here. For the sake of convenience in speaking of them to my friends, I roughly divided them into "white," or "primrose coloured;" but in fact they present a variety of tints, from the typical greenish white, through light straw, to dark cream colour. I have, moreover, a so-called "intermediate" variety of the female, between *edusa* and *helice*, of a peculiar buff, with the marginal spots whiter than in the usual form. There is a male specimen of *edusa* in my drawer, which always attracts attention from the glowing rosy violet of the hind wings—quite as shining as *Apatura iris*, but altogether of a different colour, this being very rosy. A male *edusa*, with a tinge of this lovely tint in the hind wings, was taken by Mr. F. Purchase here in September last. It is, however, not nearly so beautiful as my own.—JOSEPH ANDERSON, jun., Chichester.

VANESSA C-ALBUM IN FEBRUARY.—On February 3rd this year I caught a damaged specimen of this rare insect on the borders of some woods near the Tichborne estate. While on wing it appeared to be nothing more than a mutilated *V. urticæ*, and my only reason for attempting its capture was on account of curiosity at such Icarian behaviour. Although the morning was bright enough, the weather was not such that we might

expect hibernated lepidopterous insects to be tempted from their winter retreat.—A. J. FIELD ; 43, Medina Road, Finsbury Park, N.

VANESSA URTICÆ IN FEBRUARY.—On Feb. 18th and Feb. 19th I saw a *Vanessa urticæ* on the wing at this unusual time for butterflies.—R. J. CARTHEW ; Woodbridge Abbey, Suffolk.

ABERRATION OF PYRAMEIS CARDUI.—I have received from Mr. A. Sidney Olliff, of Sidney, New South Wales, a copy of a paper he read before the Linnean Society of New South Wales, "On two instances of Colour variation in Butterflies." In this communication he draws attention to a remarkable aberration of *Pyrameis cardui*, which had been taken at Bombala, New South Wales, by Mr. G. Masters. Mr. Olliff gives to this specimen the varietal name of *P. suffusa*, and states that it "bears a remarkable resemblance in the markings of the upper side to a variety bred by Mr. J. A. Clark, from a larva found on the banks of the river Lea, near London, which was figured in the 'Entomologist' for April, 1880. I have myself an aberration of *P. cardui*, taken at Graham's Town, South Africa, exactly like that figured in the 'Entomologist,' which I exhibited at the meeting of the South London Entomological and Natural History Society, on October 7th, 1886 (Vide 'Abstract of Proceedings for the Year 1886,' p. 60). It would therefore appear that this extraordinary aberration of *P. cardui*, of that *bizarre* character which I should have deemed not likely to have occurred more than once, has now been found in Europe, Africa, and Australia.—J. JENNER WEIR; Beckenham, February 4, 1889.

THECLA W-ALBUM IN OXFORDSHIRE.—Relating to Mr. Clarke's notice of the capture of *Thecla w-album* in Oxfordshire (Entom. 47), I may notice that this species was taken in the neighbourhood of Banbury on August 7th, 1882, when I netted a worn specimen in the road leading from Bloxham to Bloxham Grove. I mentioned this to Mr. Beesley of Banbury, who said he remembered another being caught in the same neighbourhood.—J. F. PERRY ; Oscott Cottage, Birmingham, February 9, 1889.

DEILEPHILA GALII IN SCOTLAND.—Amongst the numerous reports of the occurrence of *P. galii* last season, I have not observed any from this district. A specimen was taken inside one of the buildings connected with the Glasgow Exhibition, having doubtless flown in at the open door attracted by the electric light. It is now in the possession of Mr. E. C. Eggleton, of the Kelvingrove Museum.—T. J. HENDERSON ; 24, Florence Place, Glasgow.

SPHINX LIGUSTRI ON LAURESTINUS.—I paid a short visit to Great Malvern late in October. Very few insects were observed upon the wing, but among them were several specimens of *Vanessa c-album*, which appeared quite fresh. The larvæ of *Sphinx ligustri* had been very plentiful upon laurestinus, a shrub upon which I have never taken it before. At this late date they were still found commonly, and one specimen did not pupate till the first week of November. The larvæ of *Odontopera bidentata* were found in abundance chiefly upon the same food-plant.—ALFRED T. MITCHELL ; 5, Clayton Terrace, Gunnersbury, W., January 12, 1889.

ZYGENA LONICERÆ, VAR.—Amongst several very interesting varieties of *Z. loniceræ* which I bred last season, I obtained one with the top and

bottom wings of the left hand side alike, the bottom wing of the right hand side being of the usual red with a black border.—W. HEWETT, 3, Milton Terrace, Fulford Road, York, January, 1889.

LITHOSIA COMPLANA.—As regards the situation in which *Lithosia complana* is taken, Mr. Tutt's experience (Entom. 14) differs much from my own. The whole of my own series of some dozen specimens and a few others which have been distributed among various entomologists, were taken on heaths near King's Lynn. Further: I find that this species has been recorded in several other localities in Norfolk, and these localities are mostly situated quite inland, one or two of them nearly in Mid-Norfolk. Indeed, *L. complana* seems to be widely distributed in this county, seeing that it occurs not only on the coast (which by the way is the exception), but also in the fens, on the breck-sands, and heaths. The latter is not only the kind of situation in which this insect occurs most freely in Norfolk, but it is, I believe, in such a situation it is most generally taken in this country. On heaths the larva would most probably feed in part, if not entirely, upon the lichens which here, and I suspect not unfrequently elsewhere, cover the stony and drier ground. I may add that we take *L. complana* and the commoner *L. complanula* together, but with us the last-named species is far more abundant in woods and lanes.—E. A. ATMORE; 3, Haylett Terrace, Exton's Road, King's Lynn, Norfolk, Jan. 15, 1889.

DASYCAMPA RUBIGINEA IN WALES.—At a meeting of the Penarth Entomological Society, held on December 11th, among other specimens exhibited was a *Dasycampa rubiginea*, in good condition, captured at sugar by Mr. T. L. Howe.—G. A. BIRKENHEAD; Hon. Sec. of Penarth Entomological Society, Penarth, January 3, 1889.

THE BRITISH PLUSIA NI.—The recent records of *Plusia ni* in the south of England, and also of an American moth, *Hadena albifusa*, at the Isle of Portland, suggest an enquiry as to what is exactly meant by our *Plusia ni*. *P. ni*, a south European species, is represented in America by a form called *P. brassica*, Riley, which is abundant and injurious to cabbages in the United States. Now as it is not unusual in *Plusia*, we have in *brassica* a species so near to *ni* as to be very frequently confounded with it, and constant enough in its characters to be regarded as distinct. For this reason, a specimen now believed to be *brassica*, found in England years ago, was recorded as *ni*, and is still supposed to be such by many British entomologists. The question therefore naturally arises, are these recent captures really *ni*, Hb., or *brassica*, Riley? If they are *brassica*, the natural inference is that they are somehow imported from America, in the same way as *H. albifusa* must certainly have been. I need not go any further into this matter, but hope that a re-examination will be made of the English examples of "*ni*," to see what they really are.—T. D. A. COCKERELL; January 24, 1889.

PLUSIA CHRYSITIS.—Whilst collecting in a favourite lane about two miles from here in 1887, the moth *Plusia chrysis* appeared in great abundance among nettles which grew along a hedge side for about fifty yards. I first noticed them on the 7th of July, when I took five, and on the 8th I took two more, and on the 9th, which was the best night, they were a sight which I shall never forget. They could be taken in numbers up to seven with one

stroke of the net. On the 11th they were very plentiful, and on the 12th there were very many, but by the 18th they were all gone. The moths appeared twice each evening, soon after sunset, and again about 10 o'clock, p.m. Mr. Newman speaks of this moth in his work on 'British Moths,' as having two broods, one in June, and another in August. I have looked in vain for it in both months here, but have never seen or taken them excepting in July; the earliest capture being on the 7th of that month. I have never taken them after the 27th of July. *Plusia pulchrina*, *P. iota*, *Habrostola triplasia*, *Odonestes potatoaria*, *Noctua festiva*, were also very plentiful in the same place in 1887; while this year I have worked the locality much more frequently than last, but have only succeeded in taking six *P. chrysitis*, the first of them being taken on the 18th July, and five *P. iota*, two being very small. I only got one each of *N. festiva*, *H. triplasia*, and *P. pulchrina*, but no *O. potatoaria*. I send this note thinking it might be of some interest respecting the remarks of Mr. W. White, on the effect of meteorological conditions upon insect life (Entom xxi. 217).—W. T. RAINS; 333, Ladypool Road, Sparkbrook, Birmingham.

OXYPTILUS TEUCRII.—In his note on this species (*ante* p. 34), Mr. South seems to have overlooked the fact that *heterodactyla* was De Villers' name, not Haworth's. Careful as Haworth always was, we cannot surely accept a solitary specimen so labelled by him as sufficient proof of our *teucii* being De Villers' *heterodactyla* of 1789, to justify the rejection of its present well-known name.—C. A. BRIGGS; 55, Lincoln's Inn Fields, February 5, 1889.

ABUNDANCE OF SOME LEPIDOPTERA.—Notwithstanding the backwardness of the season of 1888, several species, although a little late, were of extremely common occurrence in the New Forest. *Macroglossa fuciformis* appeared throughout June last in utter profusion in a favourite locality, which I visited at least three times during the first and second week of the month with Mr. McRae, of Bournemouth. I believe others can give similar experience concerning the abundance of this species. *Catocala promissa* and *C. sponsa*, which emerged early in August, were also exceedingly plentiful again in a great many parts of the Forest, though *C. promissa* was much the commoner of the two, and the specimens exceptionally large, which was the reverse in 1887. I had very little difficulty in taking in one evening alone sixty picked specimens, leaving many others on the trees, sometimes noticing six to eight on a patch of sugar. On June 20th Mr. Druitt and I had a day together in the Forest, and found the little black *Gnophria rubricollis* in good condition and in very fair numbers, at rest on bracken ferns, sometimes in the very thick of the wood. One fact noticeable was their curious manner of jerking themselves upon the ground and feigning death when we were approaching them. Should one happen to be unacquainted with this peculiarity, the insects might thus easily escape detection.—J. M. ADYE; Somerford Grange, Christchurch.

LEPIDOPTERA IN GUERNSEY AND SARK.—I think Mr. W. H. Blaber's description of Sark as "a bleak and barren island" (Entom. xxi. 324) is likely to mislead, and may prevent some collectors from visiting it. All who have hitherto written about Sark consider it remarkably fertile and the following extract from 'Inglist' Channel Islands' is an exact description:—"Although Sark is usually called a table land, it is intersected by deep,

wooded, romantic valleys, watered by little tumbling brooks. I descended into all these valleys, dells, and hollows, and found some of them surpassingly beautiful,—singularly contrasting, in my recollection, with the barren and rocky coast, that so little prepares one for scenes of soft and wooded fertility. In some spots it is indeed difficult to believe that one is on a small islet, two or three leagues in circumference. One valley, the valley of Dixcart, is every way a charming spot; it is a winding valley about a quarter of a mile broad, flanked by hills that appear lofty, owing to its great depth. Wood in infinite variety fills the lower part of the valley, while the green sides of the hills, dotted with cattle, entirely shut out the view of the sea." As far as my experience goes, butterflies are more numerous in Sark than in Guernsey. I have taken twenty-six species there, viz.:—*Pieris brassica*, *P. rapæ*, *P. napi*, *Colias hyale*, *C. edusa*, *Gonopteryx rhamni*, *Argynnis latona*, *A. aglaia*, *Melitæa cinxia*, *Vanessa polychloros*, *V. urtica*, *V. io*, *V. atalanta*, *V. cardui*, *Pararge egeria*, *P. megera*, *Satyrus semele*, *Epinephele ianira*, *E. tithonus*, *Cænonympha pamphilus*, *Thecla rubi*, *Polyommatus phlæas*, *Lycæna astrarche*, *L. icarus*, *L. argiolus*, *L. ægon*. Of these, *A. aglaia* and *C. pamphilus* have never been taken in Guernsey, and *A. latona*, *V. io*, *C. hyale* and *G. rhamni* are much commoner in Sark than Guernsey. Amongst the less common moths the following have been taken in Sark:—*Acherontia atropos*, *Sphinx convolvuli*, *Gnophria rubricollis*, *Callimorpha hera*, *Bombyx trifolii*, *Saturnia carpini*, *Bryophila glandifera*, *Agrotis lunigera*, *Dianthæcia nana*, *Trigonophora flammea*, *Heliothis armigera*, and *Catocala nupta*. *C. hera* is very abundant in some seasons, and on one occasion I took as many as eighteen in one afternoon, many being of the yellow variety, *lutescens*. Is Mr. Blaber quite sure that the butterflies he noticed in Guernsey were *Argynnis paphia*? I have collected and observed our Guernsey butterflies for the last twenty years, and have never met with a single specimen.—W. A. LUFF; 12, Mansell Street, Guernsey, December, 1888.

EXTRACTION OF MOTHS FROM PUPE.—As a boy I always used to help my insects to emerge (Entom. 50 *et ante*), on the same principle that I pulled up cuttings to see if they were striking. The victims were generally *Arctia caia*, *Bombyx quercus*, and *Odonestis potatoria*. The latter sometimes developed, the two former never. The wonder was that any did, as they were extracted from the cocoons about a week after spinning up, and then gently pinched every morning like peaches, till eventually some happy morning the thoracic plates cracked. Sometimes they were peeled at once; sometimes a fragment was taken off at intervals during the day. I was led to repeat the boyish experiment in wiser years in the case of *Papilio machaon*, one of which died when fully developed, without making an effort to emerge. This led me to crack the next one, when the markings showed fully through the wing-cases, and to take the insect out. It did not seem happy; and I discovered that the wings, besides the outer case, were also enclosed in a very delicate sheath. The upper side of this had been left in the case, but under the wings some fragments were left adhering which seemed to prevent growth. These I removed and then the insect developed. But one or two subsequent operations have failed.—G. M. A. HEWETT; The College, Winchester.

SIREX GIGAS IN YORKSHIRE.—This insect was last July and August fairly common near York, several fine specimens coming into my possession.

—W. HEWETT. [I have seen occasional specimens of *Sirex gigas* among the fir woods at Sandburn, near York, where it doubtless breeds regularly.—JOHN T. CARRINGTON.]

PRIONUS CORIARIUS IN EPPING FOREST.—While taking a ramble in Epping Forest last October, I found a dead specimen of that rare beetle, *Prionus coriarius*, near Dulsmead Hollow. I have never heard of it being taken so near London but perhaps it may not be so rare near this great metropolis as we suppose.—A. J. FIELD; 43, Medina Road, Finsbury Park.

CALLICERA Aenea.—One of the rarest and most beautiful of the larger Syrphidæ, were taken last summer in three very widely scattered localities, but only in single specimens. The first was taken by the Rev. T. A. Marshall, at Cornworthy, near Totnes, July 26th; the second, by Mr. Albert Piffard, near Great Berkhamsted, Hertfordshire, August 6th; the third, by me at Guestling, near Hastings, August 22nd. All three specimens were taken on the flowers of Umbelliferæ. I believe this scarce Dipteron has but once before been recorded as occurring in Britain; its threefold occurrence last summer is therefore of considerable interest.—E. N. BLOOMFIELD; Guestling, Sussex, February, 1889.

PRESERVING PUPE OF INSECTS.—Could any one please tell me the way to preserve pupæ of insects? I wish to preserve some. I unsuccessfully tried plunging.—HUGH JACKSON; 7, North Brink, Wisbech, Cambridgeshire.

URTICATION BY HAIRS OF INSECTS.—If some of your readers who have been "stung" by the larvæ or cocoon hairs of Lepidopterous larvæ, would kindly answer the following questions either by postcard or letter, I should be much obliged, as I am endeavouring to obtain a little light on the subject of urtication:—1. By what insects "stung?" (a) By the larvæ. (b) By the cocoon hairs. 2. The part of the body affected? (a) The palm of the hand. (b) Any other part. 3. The character and appearance of the part, if any? 4. If perspiring when "stung?" 5. If the skin be thin and sensitive to the attacks of insects? 6. Any other remarks?—R. FREER; St. Mary's Hospital, Paddington, W., February 7, 1889.

HIGH FLAT-SETTING.—Might I point out one more advantage in setting insects a tolerable height on the pin, *viz.*, the prevention of grease infecting the paper or other specimens? When insects are set in the usual English fashion, their bodies, or at least part of them, generally touch the paper. If the insect greases it affects the paper, and even the cork, and spreads rapidly throughout that portion of the drawer. Now with insects set higher on the pin this is an utter impossibility, as no part of the insect touches the drawer, or another insect, if one is careful not to let it do so. The insect affected can thus grease as much as possible, without the fear of it spoiling anything save itself. One need not go to extremes with regard to the height of the insect on the pin; surely there is some medium between our low English setting and the very high Continental method. Those who object to the high setting appear to think it must mean an insect stuck on the top of a long Vienna pin, whereas one two-thirds high on our ordinary English pin, is all that is required for all practical purposes, and serves all the advantages we hold for high flat-setting.—A. E. HALL; Norbury, Sheffield, December, 1888.

TURF PLATES FOR CABINET DRAWERS.—I am arranging my collection in a new cabinet of seventy drawers, which I have lined with the German turf plates instead of cork. Perhaps it would be interesting to entomologists to know the result of my experience of this comparatively new substitute for cork. I did the lining myself. First, I reduced the plates to about half-an-inch thick. I found the best way to do this was to put the plates in a wooden tray just large enough to hold them, which I had made for the purpose, with a rim half-an-inch high all round. Any part of the plate which stood above the rim could thus be pared off with a sharp knife, and then smoothed down with a piece of No. 1½ glass paper. Next I trimmed each edge with a thin knife, the edges are liable to crumble if the knife is too thick. I found an old dinner knife the best. Then I cut the plates to fit the drawer, and used glue not too thin, as the turf soaks it up rapidly. I applied the glue to the bottom of the drawers, not to each plate, as the less one wets the plate the better. When glued in they must be weighted down until dry. When dry I rubbed over the plates again lightly with fine glass-paper, fastened to a flat piece of wood. Any holes, or cracks, can be filled up with some of the fine dust of the turf, mixed to a paste with strong parchment size. Next I gave them a coating of strong size whitening, and before it got cold, rubbed it over well with a piece of flat smooth wood, or better still, stone, so as to get the whitening well into the pores of the turf. When this is dry, smooth it down with No. 1 glass-paper. The drawer is then ready for papering, and has a smoother surface than ever obtained with cork. When it comes to putting in the insects, I have found no hard places, such as there are in cork, so the pins go in easily anywhere. Turf being thicker than cork and quite soft all through, one can push down as far as one can wish any insect set high on the pin, and bring it on a level with one that has the pin only just through it. This I find a very great advantage, as in exchanging one gets so many different styles of setting, some high on the pins some low. I was afraid at first that turf was not elastic enough to hold a pin firmly, but I find that the coating of whitening, together with the paper, makes just as good a hold for the pin as cork. On the whole, I consider turf plates a great improvement on cork; and should always recommend them for cabinets.—WILLIAM FARREN; 14, King's Parade, Cambridge. [We should like to have the opinion of those who have used turf for some time, especially in connection with ordinary brass pins.—J. T. C.]

General Index to the 'Entomologist.'

A desire has been expressed for a General Index to the Volumes of the 'Entomologist' for the last Twenty-five years, and including Vol. I. (1840-2). Such an index, framed according to the rules of the Index Society, based on the examination, by an Entomologist, of every page, and not merely a compilation from the existing indexes, would be of great value to workers, as saving much time. It would, however, be of value to the few rather than to the many, and so would not be likely to command a large sale. It is for those who desire such an index to give practical evidence of their desire by expressing willingness to subscribe for copies, and attention is called to the accompanying circular.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*February 6th, 1889.*—The Rt. Hon. Lord Walsingham, M.A., F.R.S., President, in the chair. The President announced that he had nominated Capt. H. J. Elwes, Mr. F. Du Cane Godman, F.R.S., and Dr. D. Sharp, Vice-Presidents for the session 1889-90. The Rev. F. D. Morrice, M.A., of Rugby; Mr. A. Robinson, B.A., of Brettanby Manor, near Darlington; and Mr. H. Burns, of Fulham, S.W., were elected Fellows; and Mr. B. A. Bower, and Mr. H. S. Fremlin, were admitted into the Society. Lord Walsingham exhibited a larva of *Lophostethus dumolini*, Guer., sent to him by Mr. Gilbert Carter, from Bathurst, West Coast of Africa. Mr. G. T. Porritt exhibited several melanic specimens of *Boarmia repandata* from Huddersfield, and, for comparison, two specimens from the Hebrides. Mr. M'Lachlan remarked that melanism appeared to be more prevalent in Yorkshire and the north midlands than in the more northern latitudes of the United Kingdom. Capt. Elwes read a paper "On the genus *Erebia*, and its geographical distribution." The author, after referring to the number of species and named varieties, many of which appeared to be inconstant as local forms, made some remarks on the nomenclature of the genus, and suggested that a better system of classification might be arrived at by anatomical investigation. It was stated that little was known of the early stages and life-history of species of this genus, the geographical distribution of which was Alpine rather than Arctic. The author remarked that it was curious that there was no species peculiar to the Caucasus, and that no species occurred in the Himalayas, where the genus is replaced by *Callerebia*; that none were found in the Himo-Chinese Subregion, and none in the Eastern United States of America. He also called attention to the similarity of the species in Colorado and North-West America to the European species. Lord Walsingham, Mr. Waterhouse, Mr. O. Janson, Mr. M'Lachlan, Dr. Sharp, and Mr. Jenner Weir took part in the discussion which ensued. Mr. W. Warren read a paper "On the *Pyralidina* collected in 1874 and 1875 by Dr. J. W. H. Trail in the Basin of the Amazons." Mr. C. J. Gahan read a paper entitled "Descriptions of new or little-known species of *Glenea* in the Collection of the British Museum." Dr. J. S. Baly communicated a paper entitled "Notes on *Aulacophora* and allied genera."—H. Goss, *Hon. Secretary*.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*January 24th, 1889.* T. R. Billups, President, in the Chair. Rev. Joseph Greene, M.A., was elected a member. Mr. W. H. Tugwell exhibited a fine bred series of *Deilephila galii*. Mr. J. A. Clark, *Acidalia immorata*. Mr. Adye, forms of *Argynnis paphia*, var. *valezina*. Mr. Tutt, on behalf of the Rev. C. A. Sladen, a black and almost spotless variety of *Strenia clathrata*, a melanic specimen of *Agrotis simulans*, Hufn., taken in the Hebrides. The Annual Meeting was then held. The Treasurer then read an abstract of his accounts for 1888, showing a substantial balance in favour of the Society. The Council's Report was read by the Secretary, and the following gentlemen were elected as officers for 1889. Mr. T. R. Billups, President. Mr. J. T. Carrington, and Mr. W. H. Tugwell, Vice-Presidents. Mr. E. Step, Treasurer. Mr. W. West (Greenwich), Curator. Mr. D. J. Rice, Librarian. Mr. H. W. Barker, Secretary. Mr. H. J. Turner, Assistant Secretary. Messrs. R. Adkin, C. A. Briggs, T. W. Hall, J. Henderson, W. Manger, J. R. Wellman, and J. J. Jenner Weir, Council.

February 14th.—The President in the chair. Mr. A. C. Vine was elected a member. Mr. Adkin exhibited examples of *Arctia caia* from Morayshire and Kent, and *Hydræcia nictitans*, from Morayshire. Mr. Tugwell, a marked variety of *Chærocampa porcellus*, the usual deep rose colour of the wings being replaced by a pale olive-green, shaded with grey markings; also a variety of *Deilephila galii*, bred from larva taken at Deal, the usual characteristic markings of dark olive-green, being replaced by dull grey, the pale streak that runs from the inner margin to the tip of the wing being obscured and dull in colour; inferior wings of a dull pale grey, lacking the rich rose shade at the anal angle. He remarked that he had bred two of this variety, and up to the present time seventy of the type. Mr. Turner, light forms of *Zygæna filipendula*, from Reigate. Mr. C. A. Briggs, *Triphæna comes* and *T. pronuba*, from various localities. Mr. Weir exhibited three male and three female specimens of a butterfly he had received from the Falkland Islands. They were of the same genus as our well known *Brenthis* (*Argynnis*) *selene* and *B. euphrosyne*, and were apparently closely allied to the Chilian *B. anna*, Blanch. Mr. Weir stated that he had not yet been able to make the necessary references, but he was at present disposed to regard them as a species new to science; and if upon future examination he found his view correct, he proposed for them the name of *Brenthis falklandica*. He thought the specimens were sexes of the same species although the shape of the upper wings differed materially, and the difference in the colouration of the underside of the under wings was considerable; but on the other hand he could detect no difference in the distribution of the colour on the upper side of either of the upper or lower wings. It was interesting that palæarctic and nearctic genera of Lepidoptera reappeared at the southern part of S. America, which were quite unknown over a vast extent of the intermediate latitudes. But it should be borne in mind, that there was in the American continents an almost continuous chain of mountains from the Arctic Ocean to the Straits of Magellan, which might have formed a connected temperate region by which the migration of species from the north to the south was effected at a time when the temperature of the earth was different to that which now obtains. Mr. Tugwell, two very dark specimens of *Boarmia repandata*, received from Mr. Porritt. Mr. Weir read a letter from Dr. Percy Rendall, who is now resident at Bathurst, Gambia. Observations were made upon a reported case of stridulation by a species of *Vanessa*, and a discussion ensued.—H. W. BARKER, *Hon. Sec.*

REFERENCE ENTOMOLOGICAL SOCIETY.—The report of the Committee of the South London Entomological and Natural History Society read recently at the Annual Meeting, contained allusion to the scheme for a Reference Society, as discussed last year (*Entom.* xxi. 10, 68, 121). It will be remembered that it was found impracticable with a small subscription to institute an independent Society upon the lines indicated; so the South London Society stepped in and enlarged their facilities for country membership. The result has been eminently successful, and many entomologists, representing students of various orders, have not only joined, but availed themselves of the use of the library and naming of specimens sent up for the purpose. It seems desirable that these facilities should be widely known, for they cannot fail to be most useful to entomologists residing in localities.—[J. T. C.].



F.W. Prohawk del. et lith.

West Newman & Co. imp.

New species of *Deltoids* & *Pyrales*.



F.W. Fröhawke del et lith.

West, Newman & Co. imp.

New species of Deltoids & Pyrales.



F.W. Frohawk del et lith

West, Newman & Co. 1111

New species of Deltoids & Pyrales.

THE ENTOMOLOGIST.

VOL. XXII.]

APRIL, 1889.

[No. 311.]

LIST OF THE BRITISH STRATIOMYIDÆ, WITH ANALYTICAL TABLES AND NOTES.

By E. BRUNETTI.

SINCE the publication of Walker's work on British Diptera in the 'Insecta Britannica,' many important changes have been made in the classification and nomenclature of this order, and his work requires a large number of corrections and additions. A new work on the whole of the British Diptera is much to be desired, and Mr. Verrall's recently published list, which comes almost as a revelation, will form a splendid basis for operations.

A comparison between Walker's list of Stratiomyidæ and the species recognised in this paper as truly British, will show at a glance in what an unsatisfactory state are most of the hitherto published works on our indigenous species of this order.

BRITISH STRATIOMYIDÆ.

- | | | |
|--------------------------------|----------------------------------|----------------------------------|
| PACHYGASTER, Mg., 1804. | <i>nigripes</i> , Verr., 1887 | <i>infuscatus</i> , Mg., 1822 |
| <i>ater</i> , Panz., 1798 | <i>pulchella</i> , Mg., 1822 | <i>flavipes</i> , Mg., 1822 |
| <i>leachii</i> , Curt., 1824 | <i>morrisii</i> , Curt., 1824 | |
| <i>arsalis</i> , Zett., 1842 | | CHRYSONOTUS, Loew., 1855. |
| | STRATIOMYIA, Geof., 1784 | <i>bipunctatus</i> , Scop., 1763 |
| EPHIPPIUM, Lat., 1809. | <i>longicornis</i> , Scop., 1763 | CHLOROMYIA, Dunc., 1837. |
| <i>thoracicum</i> , Lat., 1809 | <i>riparia</i> , Mg., 1822 | <i>formosa</i> , Scop., 1763 |
| NEMOTELUS, Geof., 1796. | <i>furcata</i> , F., 1792 | MICROCHRYSA, Loew., 1855. |
| <i>lignosus</i> , L., 1767 | <i>chamaleon</i> , DeG., 1752 | <i>polita</i> , L., 1761 |
| <i>antherinus</i> , L., 1761 | <i>potamida</i> , Mg., 1822 | <i>flavicornis</i> , Mg., 1822 |
| <i>virginus</i> , Fall., 1814 | | |
| <i>solatus</i> , Staeg., 1842 | ODONTOMYIA, Mg., 1804. | |
| OXYCERA, Mg., 1803. | <i>microleon</i> , L., 1761 | BERIS, Lat., 1802. |
| <i>rilineata</i> , F., 1781 | <i>argentata</i> , F., 1794 | <i>clavipes</i> , L., 1767 |
| <i>analis</i> , Mg., 1822 | <i>ornata</i> , Mg., 1804 | <i>vallata</i> , Forst., 1771 |
| <i>engicornis</i> , Dale, 1842 | <i>tigrina</i> , F., 1781 | <i>chalybeata</i> , Forst., 1771 |
| <i>erminata</i> , Mg., 1822 | <i>angulata</i> , Panz., 1798 | <i>fuscipes</i> , Mg., 1820 |
| <i>ardalina</i> , Mg., 1822 | <i>hydropota</i> , Mg., 1822 | <i>morrisii</i> , Dale, 1842 |
| <i>formosa</i> , Mg., 1822 | <i>viridula</i> , F., 1775 | |
| <i>pygmæa</i> , Fall., 1817 | SARGUS, F., 1798. | ACTINA, Mg., 1820. |
| | <i>cuprarius</i> , L., 1761 | <i>tibialis</i> , Mg., 1820 |

TABLE OF GENERA.

A. Abdomen of only 5 or 6 segments, Scutellum unspined, or with only 2 spines.	
B. Discoidal cell, emitting 3 veins.	<i>Pachygaster.</i>
BB. Discoidal cell, or this and the posterior basal cell, together emitting 4 veins.	
C. Scutellum spined,	
D. Thorax with a strong spine on each side.	<i>Ephippium.</i>
DD. Thorax unspined.	
E. First antennal joint 3 or 4 times as long as the 2nd.	<i>Stratiomyia.</i>
EE. First antennal joint at most twice the length of 2nd.	
F. Antennal style, short.	<i>Odontomyia.</i>
FF. Antennal style, long.	<i>Oxycera.</i>
CC. Scutellum unspined.	
G. Last antennal joint blunt, about $\frac{1}{2}$ length of antenna.	<i>Nemotelus.</i>
GG. Last antennal joint forming a thin style, at least as long as the antenna.	
H. Style seated before the apex.	
I. Ocelli equidistant.	<i>Chrysonotus.</i>
II. Front ocellus removed somewhat from the others.	<i>Sargus.</i>
HH. Style seated at the apex.	
J. Eyes pubescent.	<i>Chloromyia.</i>
JJ. Eyes bare.	<i>Microchrysa.</i>
AA. Abdomen of at least 7 segments. Scutellum 2, 4, or 6 spined.	
K. Discoidal cell emitting 3 veins	<i>Beris.</i>
KK. Discoidal cell emitting 4 veins.	<i>Actina.</i>

1. PACHYGASTER, Mg. (1804), Sys. Bès. iii. 146.

= VAPPO, Latr. ; NEMOTELUS, Panz. ; SARGUS, Fall.

(Germar, in 1817, gave the name PACHYGASTER to a genus of Curculionidæ).

Basal half of wing blackish. - - - - - *ater.*

Wing entirely clear. - - - - -

Legs pale yellow - - - - - *teachii.*Legs black ; anterior tibiae and all tarsi yellow - *tarsalis.*

M. Perris, a French Entomologist, considers the larva of *Pachygaster* closely allied to that of *Sargus*.

1. *P. ater*, Panz. (1798), F. Germ. liv. 5. = *pachygaster*, Fall. — Macquart gives some interesting notes on the larva in his 'Dipteres du Nord de France,' and Schilling figures it in Ent. Beit i. pl. viii. 8. Rather common.

2. *P. leachii*, Curt. (1824). Br. Ent. 42 = *pallidipennis*, Mcq. — Walker mistakes femora for tibiae in speaking of the brown spot on the hind pair. Not common.

3. *P. tarsalis*, Zett. (1842), Dip. Scan. i. 152. — Very rare. Mr. Verrall found one in the late Mr. Wilson Saunders' collection, and introduced it to the British fauna in the Ent. Mo. Mag., 1886, p. 179.

2. EPHIPPIMUM, Lat. (1809), Gen. Crust. Ins. vi. 276.

= STRATIOMYS, Pz. ; CLITELLARIA, Walk.

1. *E. thoracicum*, Lat. (1809), l. c. 276. = *ephippium*, Walk., ; larva (figures), Westw. Class. Ins. ii. fig. 127, 128. — Very rare. It has been taken in Coombe and Darenth Woods. In the British

Museum and Mr. Dale's collection. Von Heydon has taken the larva in a nest of *Formica fuliginosa*.

3. NEMOTELUS, Geof. (1796), Hist. d'Ins. ii. 542.

= STRATIOMYS, F.; MUSCA, L.

A. Abdomen in male basal half white, apical half black; in female all black, with a dorsal row of yellowish white spots.

1. ♂. Basal half of abdomen unspotted, belly white, humeral spots blackish.

♀. Sides of thorax unstriped. - - - - *pantherinus*.

2. ♂. Basal half of abdomen unspotted, belly black, humeral spots whitish.

♀. Sides of thorax with a white stripe, no white spot above the antennæ. - - - - *uliginosus*.

3. ♂. Basal half of abdomen with a central black spot.

♀. Sides of thorax striped, a white spot above the antennæ. *notatus*.

AA. Abdomen in male and female all black. - - - - *nigrinus*.

1. *N. uliginosus*, L. (1767), Sys. Nat. ii. 983. = *muticus*, F.; *bifasciatus*, Mg.—I have a specimen from the late Mr. Walker's collection, in which the abdomen is brown instead of yellowish white. Common. Very variable.

2. *N. pantherinus*, L. (1761), F. Suec. (1783). = *marginatus*, F.; *uliginosus*, Pz.; *marginellus*, Fall.; *muticus*, Schr.—This species is said never to be taken in company with *N. uliginosus*. Common. Very variable.

3. *N. nigrinus*, Fall. (1814), Strat. 6; Curt. 729. = *nigritus*, Pz.—Curtis says this species has a greenish cupreous tinge, which I have not noticed, but perhaps this is the case during life. Not common.

4. *N. notatus*, Staeg. (1842), in Zett. Dip. Scan. i., 148. = *ventralis*, Mg.—Introduced as British by Mr. Verrall, in the Ent. Mo. Mag. for Jan., 1886. Rather rare.

Walker and Curtis both say *N. brevirostris*, Mg., has been taken near London, the former adding, "in the Entomological Club;" but as I can trace no specimen, and it is a very rare species on the Continent it seems advisable to exclude it until further capture takes place. Nearly all the species of *Nemotelus* are very variable, and it is difficult to determine them with certainty unless a series of specimens is available for examination.

4. OXYCERA, Mg. (1803), Illiger's Mag. ii. 265.

= SARGUS, ODONTOMYIA, Lat.; STRATIOMYS, F.; MUSCA, L.

A. Abdomen green (or greenish yellow in one var.), with black markings never extending to the edge. - - - - *trilineata*.

AA. Abdomen black, with yellow spots or bands always extending to the edge.

B. Wings with dark brown suffusion below the stigma. - - *analis*.

BB. Wings without suffusion.

C. Abdominal spots only at the extreme edge and tip often united, or abdomen all black.

D. Abdomen all black.

- E. Antennæ long; legs black; in female yellow with black tarsi tips.
longicornis.
- EE. Antennæ moderate; legs tawny yellow; in female with black ring on posterior femora - - - - - *terminata.*
- DD. Abdomen with yellow side spots.
- F. A broad yellow band round the sides of the thorax, interrupted at base of wing. Apical abdominal spot usually united to the others.
- G. Antennæ tawny. - - - - - *pardalina.*
- GG. Antennæ black - - - - - *formosa.*
- FF. A very thin band round the sides of the thorax. Apical abdominal spot seldom united to the others. - - - - - *pygmaea.*
- CC. Abdominal spots large and wide, extending nearly across the disc, and with one large apical spot.
- H. Thorax striped in female. - - - - - *pulchella.*
- HH. Thorax not striped in female. - - - - - *morrisii.*

1. *O. trilineata*, F. (1781), Sp. ins. ii. 418. = *hypoleon*, L.—A not uncommon variety, known as *collaris*, is yellow instead of green. Not rare. Occurring near London.

2. *O. analis*, Mg. (1822), Sys. Bes. iii. 130.—An uncommon species, easily recognised by the suffused stigma. Dorsetshire is the only locality I know of. This county seems to produce nearly all the known British species of this genus, they are certainly all much more abundant in the extreme south-western counties of England than elsewhere.

3. *O. longicornis*, Dale (1842), Ann. Nat. His. viii. (431). = ? *terminata*, Wlk.: ? *tenuicornis*, Mcq.—A rare species, recognised by the much lengthened antennæ. One var. with a very narrow abdominal border from the middle to the apex seems to be the *terminata* of Walker, whose description applies only to the female, as he says "legs tawny," whereas in the male they are all entirely black. It appears to be closely allied, if not identical with, Macquart's *tenuicornis*; in the latter event *tenuicornis* has priority. Without seeing Macquart's type it is impossible to speak with certainty. The female may be separated from the female *terminata* by having a pair of whitish yellow spots on the vertex of the head which are absent in *terminata*.

4. *O. terminata*, Mg. (1822), Sys. Bes. iii. 130.—Very rare. It was a long time before I was satisfied that this was really a British species, but I have recently seen some specimens from Mr. Dale's collection taken in Dorsetshire, which are undoubtedly of this species. Walker says there are four yellow spots behind the eyes, but this is not the case, his description evidently being of a variety of *longicornis*. Curtis gives Pinny (June and July) as a locality, taken by Mr. Morris, in company with *O. pardalina*, but without seeing the actual specimens it would be rash to conclude they were correctly named, owing to the great increase in the number of known species of this genus and their close affinities.

5. *O. pardalina*, Mg. (1822), Sys. Bes. iii. 128.—Walker says "not rare," but I have not seen any British specimen of it yet.

Mr. Verrall includes it in his list, and Mr. Dale records it from Dorsetshire. It is certainly a rare species.

6. *O. formosa*, Mg. (1822), Sys. Bes. iii. 127. = *nigricornis*, Enc. meth.; *muscaria*, Mg.—Rather uncommon. From the South Coast and Dorsetshire.

7. *O. pygmæa*, Fall. (1817), Strat. ii. = *affinis*, Curt.; *muscaria*, Wlk.—In one male and one female in Dr. Mason's collection the whole underside of the abdomen is black, with two or three yellow bands extending across it. Schiner says the scutellum is black, but I find the posterior border more or less yellow, in one specimen in the British Museum it is entirely yellow. Curtis gives this as a synonym of *muscaria*, Fab., but both are distinct; the latter, moreover, does not appear to be British. Not uncommon. Mr. Verrall found it abundant once at Tuddenham.

8. *O. nigripes*, Verrall.—I have not seen a specimen of this species, which is new to science, recorded by Mr. Verrall from Scotland, but it seems to fall in this division of the genus. As I do not know the characteristics of this species, it was impossible for me to insert it in my analytical table.

9. *O. pulchella*, Mg. (1822), Sys. Bes. iii. 125. = *vara*, Walk.; *hypoleon*, L.—In one specimen in Dr. Meade's collection the whole of the basal half of the abdomen is tawny. In Dr. Mason's collection I found what appears to be an interesting variety, with two triangular yellow spots on the vertex of the head, a yellow edge to the abdomen, and entirely tawny legs, with the exception of black tarsal tips. Rather common.

10. *O. morrisii*, Curt. (1824), Br. Ent. 441.—The female is easily distinguished from the last species by the thorax being unstriped. The male is still unknown. Rather rare but widely distributed, as I have a list of eight well separated localities in England and Ireland. It is much smaller than its congener *pulchella*.

It is difficult to determine exactly how many species of *Oxycera* are really British, as several have been introduced at a time when the genus was less well understood, and in consequence have to be erased from our list. Curtis introduces *O. leonina*, Pz., recording one female from Pinny, taken by Mr. Morris, but I cannot trace the specimen. This species is allied to the *longicornis* group. The abdomen is all black with a single yellow apical spot. Walker introduces *muscaria*, F., saying it is "not rare in England and Ireland," but I can find no proof of its having been taken here. He also introduces *falleni*, Staeg., and *dives*, Lw., as British, the first on the authority of Haliday from Ireland, the latter as being in the Entomological Club collection from England, but I can trace no specimens of either species, both of which are rare on the Continent. There is certainly a

large species of *Oxycera* allied to *pulchella* in the Entomological Club collection, but it is not *dives*, and as it has no history attached, it would be unsafe to infer the specimen is British.

5. STRATIOMYIA, Geof. (1784), Ins. ed. Fery.

= THYREODONTA, Rond.; ODONTOMYIA, Lat.;

HIRTEA, Scop.; MUSCA, L.

- A. Abdomen without spots or bands. Thorax with ferruginous hair
longicornis.
AA. Abdomen with yellow spots or bands. Thorax with grey hair.
B. Abdomen with 3 distinct pairs of spots; no bands.
C. Belly black.
D. Four yellow stripes on belly. Abdominal spots yellow. - *furcata*.
DD. Three yellow stripes on belly. Abdominal spots whitish. - *riparia*.
CC. Belly yellow, with 3 irregular black bands. - *chamæleon*.
BB. Abdomen with 1 pair of spots and 2 bands, the first interrupted in male.
potamida.

The larva of *Stratiomyia* seems to frequent unusual localities, as one has been found in a hot spring in Colorado, and another in sea water. It appears also very tenacious of life, as a correspondent of the 'Entomologist,' vol. xiii., records one having lived for three months in sand without any moisture to sustain life, and on being placed in water soon recovered its ordinary activity.

1. *S. longicornis*, Scop. (1763), Ent. Carn. 999. = *strigata*, thoracica, F.; *villosa*, *nubeculosa*, Mg.—A somewhat variable and uncommon species. The ferruginous colour of the pubescence on the thorax is much more pronounced in the male. I have seen it from Acton, Lewes, Colchester and Hastings. In the species of this genus, except *potamida*, males are smaller than the females.

2. *S. riparia*, Mg. (1822), Sys. Bes. iii. 138. = *strigata*, Mg.—A much rarer species than the latter, and allied to both that species and *furcata*. Seaford. The female of this and the next species has bare eyes, and were it not for this, Rondani's genus, *Thyreodonta*, would stand good for those species of *Stratiomyia* with pubescent eyes.

3. *S. furcata*, F. (1792), Ent. Sys. iv. 264. = *chamæleon*, L.; *panthæleon*, Fall.; *singularis*, Harris.—Rather common, generally distributed. Closely allied to the preceding species.

4. *S. chamæleon*, De G. (1752), Ins. vi. 64. = *aquatica*, Frisch.; *sellata*, Sulzer; *nigrodentata*, Mg.; larva, Walk., Ins. Brit. Dip. i. 14.—Walker illustrates and describes *potamida* as *chamæleon*, and erroneously gives the former as a synonym. Swammerdam first described the larva. In the British Museum collection is a variety with the first two antennal joints tawny. Rather common, but less so than *furcata*. Generally distributed.

5. *S. potamida*, Mg. (1822), Sys. Bes. iii. 136. = *chamæleon*, Walk.—Commoner than the preceding. Widely distributed. All the species of this genus, except *riparia*, occur around London.

(To be concluded.)

NOTES UPON *PHYTOMYZA CHÆROPHYLLI*, KALT.

BY PETER INCHBALD, F.L.S., AND R. H. MEADE.

At the close of December, 1888, I recently gave some account (Entom. xxii.) of the habits of this mining Dipteran, in the pupa-condition of life, giving the food-plant, and its singular tunnel in the leaflet-segments of the *Chærophyllum temulum* and other allied species. I looked for it to put on wings in the spring, but I did not expect to see it until April or even May. Several, however, have emerged from their pupa-cases in February. I have reared nearly a dozen, both males and females, and narrowly watched their development. Two broods thus occur in the year, in spring and autumn.

Kaltenbach was, I believe, the first to rear the tiny Miner, and after him our fellow-countryman Hardy, who characterised it by the generic name of *Chromatomyia*, from its peculiarly-shaped pupa-case. I sent living imagines to Dr. Meade, who has furnished me, most kindly, with an admirable diagnosis of the fly, which will be appreciated by all who study the minuter forms of Dipterous life.

PETER INCHBALD.

Grosvenor Terrace, Hornsea, Holderness, February 16, 1889.

Phytomyza (Chromatomyia, Hardy) chærophylli*, Kalt.

Nigro-cinerea obscura; ventro pallido nigro-fasciato; proboscide halteribusque albidis; pedibus cinereis, genubus prioribus flavidis; alis sub-cinereo-hyalinis, venis long. 4 tis pone apicem excurrentibus. Long. ♂ et ♀ 1—1½ mm. (circiter ⅓ lin). Dull grey; eyes red (in life); head, face, palpi, and antennæ, black; proboscis pale yellow; thorax, with scutellum, dark grey, without lustre, with a few long whitish hairs upon the sides; and two rows of fine dorso-central bristles rather wide apart, seated upon very minute black spots. Abdomen dull blackish grey upon the dorsum, and yellowish white beneath. The posterior edges of the segments are marked upon the back with very fine pale transverse lines, which coalesce on the sides with the white ventral surface. The latter is furnished down the centre with a series of quadrate black spots. The anal segment in the male is small, round, prominent and shining black. Halteres large and milk-white. Legs wholly black-grey, with the exception of the knees and roots of the tibiæ of the front pair, which are pale yellow; the extremities of the knees of the posterior pairs show a yellow point in some specimens. Wings hyaline, with a slightly dusky hue; the costa and three first longitudinal veins are robust and black; the fourth and fifth longitudinal are paler, but quite distinct; and the anal vein is well developed, and extends about two-thirds of the way to the margin of the wing. The transverse vein is single and very short; the third longitudinal reaches the

* Hardy separated the species of *Phytomyza* of Fallen into two genera, on account of the different forms of the pupæ, which in some are barrel-shaped, in others slipper-formed. The former he termed *Chromatomyia*, the latter *Phytomyza* (Annals of Nat. Hist., W. 385).

margin of the wing some way before the apex; and the fourth a short distance behind it.

The female closely resembles the male in every respect, only it has the abdomen furnished with a short pointed shining black oviduct.

This small species is closely allied to *Phytomyza nigra*, Mgn., and to *P. obscurella*, Flin. The description of the former is so short that its identity cannot be determined with certainty; but the knees of all the legs are described as being pale. *P. obscurella* is said to differ from *Charophylli*, by having knees likewise pale, the abdomen shining black, and the ends of the fourth longitudinal veins of the wings close to the apex.

These little flies shrivel up and alter so much when dry, that comparisons between old preserved specimens are of little use; descriptions taken from recently killed examples must be consulted for the purpose of identification.

R. H. MEADE.

RHOPALOCERA AT WIESBADEN.

By R. M. PRIDEAUX.

WIESBADEN is situated on the right bank of the Rhine, about $2\frac{1}{2}$ miles from the river. The tract of country lying between the town and the Rhine consists entirely of cultivated ground, bare hedgeless tracts of which are studded with apple, pear, walnut-trees, &c., and divided up by cart-tracks and paths. North-west of the town, however, lie the Taunus Hills, being a wooded district intersected by broad well-watered valleys, and it is here that collecting can be most profitably pursued. The woods on the hills consist for the most part of beech and oak; occasional patches of fir and larch being planted here and there. The valleys that lie between the hills are very fertile, and watered by one or more small clear streams. There is no undergrowth allowed to grow in the woods, and there are very few hedges, the absence of which, both as "cover" for the imagines and food for their larvæ, doubtless accounts for the scarcity of some kinds of Lepidoptera, which is especially noticeable among the Geometræ. A great variety of flowers and coarse plants, especially Umbellifera, grow in the green valleys, which are always mown down for hay during July. The late spring of 1888, and the exceptionally wet and cold summer that followed it, render the experiences of that one season hardly representative of what one might expect to meet with under more ordinary conditions, both as to times of occurrence and numbers of specimens. In the former, especially, I found that my own observations seldom coincided with those set forth in a work—'The Lepidoptera of the District of Wiesbaden,' by Dr. Adolph Rossler, which was

published some eight or ten years ago. I shall mention the *Rhopalocera* in their usual classified order, not in the order of their occurrence, to avoid repetition in case of double-brooded insects.

Papilio machaon is double-brooded. The first brood appeared from the 18th of May, and continued throughout June, being fully a month late; the second brood throughout August. They are generally distributed about the wood-valleys and cultivated fields, but nowhere very abundant. *P. podalirius* is single-brooded, and a good deal scarcer than the last-named, and appeared about a week later. Its increasing rarity is attributed, and, no doubt rightly, to the destruction of hedges containing sloe, the food-plant of the larva. The imagines I noticed once or twice at the blossoms of the lilac in the gardens skirting the town.

Aporia crataegi was abundant in the valleys by about June 12th, and was but a short time on the wing. The larvæ were common during April and May wherever sloe grew, and I took one web of them on hawthorn. They also feed on the cultivated plum trees, so the butterflies are not confined to the woods but are common in the fields, where I noticed them pitched on the corn-stalks in dull weather.

Pieris brassicae, *rapæ* and *napi*, were all abundant and double-brooded. The under sides of the second brood of *P. rapæ* are of a much brighter yellow tint than those of the spring brood.

Anthocharis cardamines was fairly common throughout May. I was unable to remark the difference between these and my Clifton specimens of *cardamines*, mentioned by Mr. J. J. Weir (Entom. xxi. 143), the orange patch not occupying more space on the hinder angle than in English examples.

Leucophasia sinapis was abundant but rather local, preferring the damper places in the wood-meadows. The first brood began to appear on May 13th, and the second on July 20th.

Gonopteryx rhamni was abundant about the woods, being seen from July 25th on, the hybernated ones being common in the spring.

Colias hyale is double-brooded at Wiesbaden, and last year was abundant in both broods. The first began to appear at the end of May, and continued throughout June. Insects of the second brood continued common both on the clover-fields and in the meadows and woods throughout August and September. I could detect no radical difference, either in size or markings, between the two broods, but in both, the butterflies varied very considerably in size, breadth of the black margin, and chiefly in the intensity of colour; there being every intermediate shade between a lively yellow, and white, scarcely perceptibly tinged with yellow. Of *Colias edusa* I did not see a specimen; they are said to be as capricious in their appearance as with us.

Argynnis paphia was very abundant. I noticed the first specimen on June 29th, and they remained on the wing throughout July and the first half of August. As with us they preferred the bramble blossoms on the outskirts of woods. I did not see the variety *valesina*. *A. adippe* appeared on the wing later than any of the other *Argynnidæ*, the first specimen I met with being on July 20th. It was on the wing for about a month, and was not very abundant. They flew along with *aglaia* and *niobe* in the flowery valleys lying between the woods. On July 21st I had the good

fortune to capture a fine specimen of the variety *cleodoxa*, having the usual silvery spots replaced by fulvous. *A. niobe* was, by June 20th, already very abundant in the valleys, it being the first of the larger fritillaries to appear. The variety *eris*, in which the silver spots are replaced by fulvous, was quite as common as the type: males being apparently more subject to this variation than females. Intermediate varieties between *eris* and the type, having the silver spots only partially replaced by fulvous, were rare. *Niobe* continued on the wing throughout the remainder of June and July. *A. aglaia* occurred a little later than *niobe*, and was not quite so abundant, but was found in the same situations. *A. latona* did not occur with the others of the genus in the damp, fertile valleys, but preferred dry, stony ground not near woods, and especially in stubble-fields. In such places it was fairly common during the last half of August and through September. There are said to be two broods previous to this one, but I did not observe the insect before August 12th. *A. euphrosyne* first appeared on May 16th, and was on the wing about three weeks. Very common in the damp valleys. No sign whatever of a second brood. *A. selene* was abundant, but more local than *euphrosyne*, preferring damper spots as a rule. It emerged eight or ten days later than the last insect. There was a partial second brood early in August, specimens of which were smaller than those of the spring brood. *A. dia* was the first of the genus to appear, being already abundant in the damp valleys by May 16th. They seemed somewhat local, but were nowhere scarce. The second brood, which produces specimens as abundantly as the first, began to appear on July 20th. These did not differ in the slightest in size or appearance from the spring brood.

Melitæa aurinia was abundant in the low-lying valleys from May 24th till the middle of June. Neither this species nor the rest of the *Melitæa* genus were nearly as local as they are with us, but most of them, except *M. didyma*, distributed pretty generally about the marshy meadows intersecting the woods. Of *M. cinxia* I netted a few specimens during the last week of May. It was not so abundant as the rest of the genus. It is single-brooded. *M. didyma* is double-brooded. I only met with one specimen of the first brood, and it was larger than any I subsequently took in July. Although a few specimens may occasionally be found in the wood-valleys, I found the head-quarters of this insect to be on a steep hill-side, covered with short grass, not mown for hay, and some distance from the woods. Here in occasional spots it swarmed during the last ten days of July. *M. athalia* was common from May 27th to the end of June, and could scarcely be called local. I met with a few solitary specimens in the beginning of August which seem to give evidence of a partial second brood. I took a good specimen of a variety much resembling the fourth figure of *M. athalia*, given in Newman's 'British Butterflies.' *M. aurelia* was far the most abundant of the genus, it swarming in all the meadows in woods during the last half of June and through July. I took a variety of the same sort as that of *M. athalia*, having the fulvous tint greatly predominating. *M. dictynna* was very scarce. I took two or three specimens at the end of June, flying with *M. aurelia*, which they greatly resembled in flight.

Vanessa c-album is double-brooded at Wiesbaden. The first brood appeared at the end of June, and the second about the middle of August. They were somewhat local, preferring stony ground, but nowhere scarce. Specimens of the first brood were lighter and larger than those of the second. *V. c-album* was the first, along with *V. polychloros*, to appear

after hibernation in the spring. *V. polychloros* is single-brooded, and was abundant both before and after hibernation. I took the larva from wych elm, and saw the first freshly-emerged imago on June 28th. They seemed all to have retired to their winter quarters before the beginning of August. *V. urticae* did not appear nearly so commonly as the last insect. The larvæ were fairly abundant in August. *V. io* was common at the beginning of August, and the larvæ at the end of June. Of *V. atalanta* I saw one or two specimens during the last half of September in 1887, but did not observe any up to the end of August, 1888. *V. antiopa* was seen abundantly in the spring after hibernation, and continued to fly till the middle of June. The borders of all these were, without exception, white, like the so-called British *antiopa*. I saw a few at willow bloom, and also at the pear blossoms. The first freshly-emerged butterfly I took was on August 2nd, and they continued on the wing for about three weeks, and then disappeared, retiring presumably to their winter quarters. They were now by no means as commonly seen as in the spring. I never observed a specimen settle on a flower, they seeming to prefer puddles in the roads or putrid matter to feed on. The borders of all the fresh specimens was a rich buff colour. I noticed that the size of the blue marginal spots varied considerably on different specimens. At Wiesbaden the larvæ feed usually on willow. Mine eat birch or willow indiscriminately in confinement. In the pupæ I met with, the metallic spots usual to the genus were scarcely perceptible. *V. cardui* was common on the tracks about the cultivated ground during June, and was abundant in the same situations through August.

Limenitis sibylla was generally distributed, but not very common in the woods during July and first half of August. I netted a few specimens at bramble blossom.

Apatura iris I saw settling in the muddy puddles on roads in the woods on July 9th, also some flying high over the oak trees. Owing to the rest of the month being for the most part very cold and wet, I only once observed *iris* again, and then far out of reach. I beat a few young larvæ of this and the next species from willow late in October, and hope to rear them successfully when the spring comes. Early in November these larvæ spin a carpet of silk on a twig of willow, and attach themselves firmly to it, after which it is impossible to dislodge them by beating. *A. ilia* was more abundant than the last. The males of this beautiful species were to be seen sunning themselves on the muddy roads early in July.

Melanargia galatea swarmed from the end of June till the beginning of August in all the meadows.

Satyrus semele was rare. I saw one or two specimens by an unworked limestone quarry.

Pararge egeria was also scarce. I noticed a few specimens about the middle of May and two more in July. *P. megæra* I did not see anything of till the end of July, when it began to appear abundantly on all the stony tracks about the corn fields.

Erebia medusa appeared very locally on marshy spots in the wood-meadows on May 30th, and continued a short time on the wing. *E. athiops* was abundant, but also local during the first three weeks of August. It seemed to prefer drier situations than *E. medusa*. The colours and markings of the underside of *E. athiops* presented a great deal of variety.

Epinephele ianira swarmed everywhere in June, July and August.

E. tithonus was scarce. I saw a few specimens at bramble blossom early in August. *E. hyperanthes* was distributed about the woods, and was partial as usual to bramble blossom. I took a specimen of the variety *arete*, with each eye-spot barely indicated on the underside by a white speck.

Cænonympha arcanus, occurred from June 20th till the end of July, and was common on all grassy places, and in the more elevated meadows. *C. pamphilus* was abundant everywhere.

Thecla betulae I saw rarely in the perfect state, flitting on the outskirts of woods. The larvæ were abundant on sloe in May and June, from which I bred several imagines. *T. ilicis* was fairly common but local from June 25th on the blackberry blossoms, from which they were easily taken. I subsequently saw two or three at the wild thyme. *T. quercus* was scarce. I netted two or three during July. *T. rubi*, though supposed to be double-brooded here, did not put in an appearance a second time, but was very abundant in May and first half of June.

Polyommatus virgaureæ was scarce. They prefer the more highly situated meadows in the woods. I netted about eight females during the first half of August, and only two males. *P. chryseis* was also not common and decidedly local, preferring the marshy spots in the meadows, where one might meet with one or two specimens by some hours' hunting. I took more males than females of this species, possibly owing to their being so much more conspicuous. *Chryseis* is single-brooded, and occurred during the latter half of June. *P. doris* was the most abundant of the "Coppers," it being apparently double-brooded, and occurred most commonly during the last half of May and first half of June, and then in greater profusion in August. The great difference between the males and females of this species, both as to markings and outline of the wings is somewhat puzzling at first. The tawny patch in the centre of the forewing of the male, varies very much in extent and brilliancy. *P. phlæas* occurred at the same times as *P. doris*, but was not nearly so abundant.

Lycena argiades occurred but very sparingly in May, in the small form. I netted only two, a male and female of this first brood, and saw one other. The large form, the second brood, was far more abundant, preferring any piece of open rough ground to the meadows in woods, where I did not once observe it. Some disused quarries of limestone produced it most abundantly, but one met with it occasionally all over the tracks intersecting the cultivated ground. *L. ægon* was double-brooded and abundant. Large specimens of the second brood seemed to correspond to insects I saw named as *L. argus* in European collections, but I was unable satisfactorily to distinguish the two, so am not sure whether I met with the true *L. argus* or not. *L. corydon* is not supposed to inhabit the Taunus Hills, nevertheless I met with two odd specimens in different places not on chalk; one on July 22nd, and the other on August 14th. It is said to be abundant at Mayence, eight miles from Wiesbaden. *L. baton*, Bgstr. (*hylas*), occurred in May and July, and was generally distributed in the meadows in woods. They appeared far more abundant during July than in May. *L. astrarche* was scarce. I met with one or two on some broken ground during July and August. They were like our southern specimens, but rather larger than usual. *L. icarus* was very abundant everywhere and triple-brooded; specimens of the third brood were very diminutive in size. *L. bellargus* is not supposed to occur at Wiesbaden, but is abundant on the other side of the Rhine opposite. In September of 1887, however, I took several

specimens on a piece of chalky ground that was soon after built over, so *bellargus* was exterminated. These were all I met with, with the exception of a single specimen on July 22nd, in one of the more elevated of the wood-meadows, but nowhere near chalk. *L. argiolus* was very scarce; I only saw one specimen of the May brood, and netted three or four during July of the second brood. The larva is said to live on heather; it is certain that neither holly nor ivy can be its food-plants, as the former is unknown wild, and the latter plant very rare near Wiesbaden. *L. cyllarus*, Rott., was abundant but somewhat local, from the middle of May till the second week in June. It is single-brooded. *L. arcas*, Rott., and *euphemus*, Hb., were abundant, but exceptionally local, preferring marshy low-lying meadows, where *Sanguisorba officinalis* grew. The former insect was somewhat earlier than the latter, being on the wing from about July 20th till the middle of August, while *euphemus* swarmed during the last week in July and first in August. I met with some interesting varieties of *L. arcas*, both as to the number and size of the black spots on the fore wing, which are arranged much like those on *L. arion*. In one specimen all the spots except the discoidal one are obsolete. *L. arion* was abundant, and distributed wherever wild thyme grew. They were on the wing from July 18th till about the middle of August. They varied a good deal in size, my smallest specimen being 1 in. 2 lines in extent of wing, and the largest 1 in. 8 lines. The black spots on the wing varied even more than in *L. arcas* in number and magnitude, in some they are barely indicated, and in others cover the greater part of the wing. The breadth of the black margin also varies considerably. *L. acis* was rare. I only met with four, two males and two females. I took them on a sloping dry meadow on the outskirts of a wood. They appeared in June, and are single-brooded. *L. alsus* was not common. I noticed one or two specimens of both broods (occurring in June and August) on the grassy hillside of a dry meadow.

Nemeobius lucina was scarce, and continued but a short time on the wing. I netted about half-a-dozen specimens in the middle of May. The larva must feed at Wiesbaden entirely on cowslip, *Primula veris*, as the primrose is not found wild.

Syrichthus malva was abundant throughout May. Of *S. alveus* I took one specimen in a chalk pit near the Rhine.

Nisoniades tages was abundant in May, and I noticed a few specimens in July of an imperfect second brood.

Spilothyrus alcea, Esp., was common on dry grassy places during June.

Hesperia sylvanus and *comma* were both fairly common in July, in open spaces in woods. *H. thaumas* abounded everywhere in July.

This makes a total of 75 species, which number might doubtless be enlarged by harder work in a more favourable season. Butterflies got so charmingly but distractingly abundant by the beginning of June, that it became no easy matter to follow down some suspicious-looking *Lycæna* or *Argynnis* among the crowds of various insects that swarmed in the flowery valleys. I was disappointed in failing to meet with *Pieris daphidice*, but I saw no sign of it, although I netted many white butterflies on suspicion.

CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.

By J. W. TUTT, F.E.S.

(Continued from p. 62.)

Xylophasia, St., *hepatica*, L.

The type of this species is described by Linnæus, 'Systema Naturæ,' p. 853, No. 169, as "Noctua spirilinguis cristata, alis glaucescentibus; fascia ferruginea abbreviata terminalique plicata." "Dorsum pluribus exasperatum. Alarum color hepaticus: fascia ferruginea vix latus interius appropinquante." Guenée, in his 'Noctuelles,' vol. v., p. 144, says: "Linnæus has badly described it as 'wings glaucous;' and Clerck has figured it with bluish wings, which made Hübner believe that it was *tincta*." Hübner figures *tincta* under the name *hepatica*. I am inclined to think that Guenée, who was undoubtedly not well up in the varieties of this group, did Linnæus an injustice. My own impression is, that the Linnæan type was a glaucous one, and that our forms are different to the Linnæan type. There is a constant glaucous variety of *rurea* (closely allied to the type). I have a glaucous variety of *scolopacina*. Why should there not be a glaucous form of *hepatica*? The British specimens appear to be of two distinct forms, one clear dull brown, with typical markings, as in Newman's 'British Moths,' p. 285, but with no transverse markings, var. *epomidion*, Haw., the other of a redder colour, and much marbled with transverse ochreous markings. This latter marbled form is the *characteræa* of Hübner.

α. var. characteræa, Hb.—Hübner's fig. 133 may be described as having the anterior wings brown, with a reddish tinge, with the ordinary dark markings, but a number of transverse lines, ochreous outlined with black, gives the variety a very mottled appearance. The darker ground colour shows up very distinctly between the pale line near the hind margin, and the pale line just beyond the reniform. I believe this variety occurs in most British localities. I have taken it in various localities in Kent, and have received it from the neighbourhood of Barnsley (Yorkshire), the New Forest, &c.

β. var. epomidion, Haw.—This is the ordinary form which we get, "brown, without the ochreous transverse markings which occur in *characteræa*." Haworth, in his 'Lepidoptera Britannica,' p. 170, thus describes it: "Alis griseo fuscoque variis strigis tribus pallidioribus obsoletis dentatis." "Lineola basi anticarum alarum sæpe geminata; striga antica undulata (subinde omnino oblitterata), altera pone medium denticulata extus arcuata et subinde quasi geminata; tertiaque juxta marginem posticum altè et irregulariter dentata, et nebulis fuscis adnata. Margo ipse posticus fusco punctatus. Alæ posticæ ut in præcedentibus (*rurea*)."

It must be noticed that in the 'Lepidoptera Britannica,' p. 170, Haworth copies the Linnæan description of *hepatica*, which

he applies afterwards apparently to *rurea*. It must be confessed there is considerable doubt about the types of this species and *rurea*.

Xylophasia, St., *scolopacina*, Esp.

The type is represented by Esper's fig. 1, plate 130. The figure is bad, but certainly recognisable as this species. The following is the description I made of it:—"Anterior wings dark ochreous, with a decided brown tinge, a dark dash at the base of the inner margin. A dark red basal streak, paler (ochreous) orbicular, and reniform dark-centred; a dark line from costa to inner margin; between stigmata a reddish lunule on the inner edge of the reniform; a number of dark long streaks outside the reniform, and a pale wavy line parallel to the hind margin. Hind wings brownish, with a reddish tinge, upper margin dark reddish." Hübner figures (460) *scolopacina*, a small male, with ground colour pale ochreous, the middle of the wing (between the stigmata) and the outer margin reddish, orbicular indistinct, reniform white, with a small white spot beyond the reniform. Guenée says of *scolopacina*:—"It varies much in size and intensity of colour, but the lines are always more distinct than in any other *Xylophasia*" ('Noctuelles,' vol. v., p. 145). Of Freyer's, Plate lxiv., fig. 1—*scolopacina*, I made the following notes:—"Yellow ochreous with a reddish tint, a dark red lineola at base of inner margin, orbicular outlined in blackish, reniform red outlined in whitish; four dark costal streaks above stigmata, a double basal line, a waved line outside reniform, forming almost linear dots on nervures, dark reddish line parallel to hind margin." It will be thus seen that Esper's type and Hübner's figure are much darker than the generality of specimens taken in Britain, while Freyer's is very much like them. I have a specimen captured by Mr. Harrison, near Barnsley, slightly glaucous, but otherwise dark like the type. All my others are much paler. The dark type is also described in Humphrey and Westwood's 'British Moths,' vol. i., p. 160, but the pale form is figured in the same work, Plate xxxii., fig. 8. The paler form is described by Haworth as follows:—

α var. *abbreviata*, Haw.—"Alæ ex hepatico lutescentes, vel subinde saturiores varie nebulosæ; basi ad latus interius lineola nigra, fascia subfusca in medio costæ valde abbreviata; pone stigmata ordinaria obsoleta, striga tenuis nigra, regulariter et concinnè dentata: tunc striga altera crassior fusco-brunnea juxta marginem posticum, parum undulata; margine ipso ustulato, punctis circiter quinque pallidis; ciliis itidem ustulatis" ('Lepidoptera Britannica,' p. 170). As these pale specimens vary a little *inter se*, I think Haworth's name should include all our paler ochreous forms.

β. var. *nux*, Frey.?—Guenée, in his 'Noctuelles,' vol. v., p. 145, gives this as a probable variety of *scolopacina*. He says of it:—"I have not

the descriptions are identical. There is a difference in the ground colour, some being much better described by the term "fuscous" than "black." It is described by Haworth under the same name *pinastri*, as:—"Alis nigris, maculâ striatâ cinereâ aquilæ alam simulante ad angulum ani." "Cristata, niger vel ater antennis subferrugineis, thoracis dorso abdomineque cinereis. Alæ superiores posticè undulatim et striatim plus minus cinereæ. Margo tenuior etiam cinerascit. Posticæ alæ fuscæ, ciliis cinereis." Hübner also figures (246) *pinastri*, with normal anterior but bluish posterior wings. This latter is without doubt due to over-colouring. Newman in his 'British Moths,' p. 287 says:—"This is one of those moths which are constant in the arrangement and tint of their colours. I am unable to select from among the numerous specimens which have reached my hands, a single individual to which I can possibly allude as a variety." I have seen no good varieties; but some specimens have the dark portions of the anterior wings much more intense than others. Possibly the greatest amount of variation exists in the quantity of pale longitudinal markings near the hind margin, some having a large number of short longitudinal streaks especially near the apex, others being almost without them; while some have the pale marking (from which it gets its English name "the bird's wing") near the anal angle, and its continuation along the inner margin of a much clearer grey than others; in fact, I have some where this marking is almost absent, and others where it is quite whitish grey with scarcely any darker shading. I have one specimen much below the average size. Guenée in his 'Noctuelles,' vol. v. p. 146 writes:—"Superior wings brown-black, with the inner margin and a large bilobed spot at the anal angle, of a testaceous grey marked with brown streaks."

var. *pinastri*, L.—The Linnæan description 'Systema Naturæ,' 12th edition, p. 851, No. 160, is as follows:—"Noctua spirilinguis cristata, alis deflexis *nigris*: margine dorsali posticoque pallidis." "Cristæ in dorso ipsius abdominis 4 pone thoracem gibbum; characteres in alis atri." (Black instead of fuscous.)

(To be continued.)

ON THE VARIATION OF INSECTS.

By T. D. A. COCKERELL.

(Continued from p. 56.)

m. *Suppression of light markings.*

Papilio asterias asteroides, Reak. *Limenitis arthemis*; dimorphic forms, *lamina*, Fab., and *proserpina*, Edw. *Apatura iris iole*, Schiff., Newman, Brit. Butt. 72. *Mamestra persicariæ unicolor*, Stgr.—These must, I suppose, be regarded as cases of partial

melanism; but Mr. H. Goss (Entom. xi. 73), in describing a dark variety of *Chelonia villica* from Brighton, mentions that several dozen larvæ from the same place produced the type, and suggests further that the aberration was due to a diseased condition in the larva. Now this variety exhibited coalescence of the dark markings and suppression of the light ones, which further, was more complete on the right than on the left side, so it seems certain that it had nothing in relation with such cases of melanism as *Pieris napi bryoniæ*. I am therefore inclined to separate all dark forms into two groups: 1. True melanisms. 2. Cases of coalescence of markings due to disease. What the precise nature of the disease may be, and which forms precisely are to be classed in either group, is for future investigations to decide.

n. Coalescence of dark markings.

Argynnis bellona fasciata. The zigzag band fused with the outward of the inner markings, forming a wide band (Maynard). *Chrysophanus hypophlæas fasciatus*, Strecker. *C. phlæas fasciatus*, Entom. xi. 25, with fig. (W. P. Weston). *Acronycta tridens fasciata*, with marginal band, Entom. xi. 24.—In these cases the dark markings have coalesced to form bands, such as are normal with other species, and it is hard to consider them entirely as cases of disease. Whatever may be their nature, I think there can be no doubt that they point to the way in which bands were originally acquired in banded species, and very possibly by careful breeding from banded aberrations such as these, a two banded race might be formed.

Argynnis lathonia valdensis, Esp. *A. idalia*. Maynard figures a variety in which the silver spots on underside are partly coalesced.—These two examples of coalescence of the silvery markings in *Argynnis* may be considered here. They probably do not essentially differ from the other cases of coalescence cited above. Silvery markings have, however, probably originated in a metamorphosis of some white pigment, in which case *Anthocharis belia ausonia*, Hb., will be an instance of reversion.

o. Suppression of dark markings.

Nathalis iole irene, Fitch. *Lycæna astrarche deleta*, ground colour of underside pearly white, with the red marginal spots very bright, but nearly all the normal black spots absent. Entom. xii. 185, with fig. *L. icarus icarinus*, and *L. bellargus cinnus*, are also cases of suppression of markings. *L. icarus* ♂ *nigromaculata* (Entom. 1887, 216) is an opposite condition. *Melitæa cinxia paucimaculata*, Newman, Brit. Butt. p. 43. *Pieris rapæ immaculata*, tom. cit. p. 161. *Lomaspilis marginata subdeleta*, Newman, Brit. Moths, p. 101. *Abrazas grossulariata deleta*, tom. cit. 99;

also Proc. S. Lond. Ent. Soc. Pl. i. fig. 2. *Melanippe fluctuata deleta*, Proc. S. Lond. Ent. Soc. 1886, 44. *Calomela sexmaculata subdeleta*, Ent. Mo. Mag. 1885, 224.—The case of *Abrazas*, in which a many-spotted moth occasionally appears almost or quite spotless, is exactly reversed in the American *Hyphantria cunea*, Drury. Near Washington the type of this insect is spotless white, but further south a variety (*punctatissima*, Smith), is found, in which the wings are profusely spotted with black, while every gradation between these two extremes occurs. (For figures showing variation, see U. S. Dept. Agric., Entom. Div. Bulletin, 10, 1887).

p. *Unusual development of light markings.*

Papilio asterias calverleyi, Grote, "probably caused by the action of cold on the pupa soon after pupating" (G. H. French). *Grapta j-album aureomarginata*. The yellow border to the wings without marks, and bright golden yellow (Maynard). *Vanessa antiopa hygiea*, Hdrch. (= *lintnerii*, Fitch). According to Maynard, this variety is said to occur in America in the proportion of about 1 to 500, typical =; he thinks it is perhaps due to reversion. Dr. Lang states that this variety has been taken in Britain. *Zygæna filipendule cytisi*, Hb. *Vanessa cardui*, var. from Grahams-town, Proc. S. Lond. Ent. Soc. 1886, 60 (J. J. Weir).—These, of course, are similar in nature to the last, but their cause is very obscure, and probably not the same in every case. I cannot agree with Prof. French that *P. asterias calverleyi* was caused by cold, especially as he says "soon after pupating," at which period the wing-pigments would not have begun to be formed. Besides, this aberration has been taken in Florida, where severe cold does not occur.

(To be continued.)

DESCRIPTIONS OF TWO NEW SPECIES OF THE COLEOPTEROUS FAMILY CETONIIDÆ.

By OLIVER E. JANSON, F.E.S.

Clinteria rufipennis, n. sp.

Head coppery green, shining, coarsely punctured, the punctures confluent at the sides and apex, a fine smooth median line, apex of the clypeus rounded, a little reflexed, and with a small central notch. Thorax dull coppery olive, a broad angular band on each side, and a small round spot on the basal lobe pale ochreous yellow, the disk finely and very sparsely punctured. Elytra dull red with five pale ochreous yellow spots on each; the first in the centre about one-fourth from the base; the second nearer the suture, about midway between the base and apex; the third close to the outer margin just beyond the middle; the fourth near the outer apical angle; the fifth between the apical callosity and the suture; the third spot is transverse and sinuous, the others are sub-orbicular; the disk with some

rows of coarse shallow punctures and feebly bicostate. Pygidium dull olive-brown, a large triangular pale ochreous spot on each side, the apex with sparse yellow hairs. Beneath bronzy black, with large ochreous spots at the sides, mesothoracic epimera ochreous above; mesosternal process narrow, the apex compressed; abdomen slightly impressed in the centre. Legs red-brown, posterior femora with an ochreous stripe at the sides, anterior tibiæ with two lateral teeth. Length 14 millim.

Habitat, Colombo, Ceylon.

This species is allied to *C. hilaris*, Burm., but may be at once distinguished by its different coloration and narrow mesosternal process. The specimen described is a male, and was given to me by Mr. Geo. Lewis.

Clinteria caliginosa, n. sp.

Deep black, thorax and elytra dull, the other parts shining. Head closely punctured, a slight longitudinal elevation between the eyes; clypeus impressed on each side, the apex rounded, narrowly reflexed and very slightly emarginate. Thorax with a narrow interrupted white lateral border, very coarsely punctured, the sides rounded. Elytra with four white spots on each; the first in the centre of the disk; the second and third close to the lateral margin between the middle and apex; the fourth between the apical callosity and the suture; the disk feebly bicostate, and with rows of coarse shallow punctures. Pygidium coarsely and transversely strigose, a very small white spot on each side. Beneath very coarsely strigose, and with sparse black hairs at the sides; sides of the abdomen and the legs very coarsely punctured; mesosternal process short and narrow, its apex obtuse and a little divergent; anterior tibiæ with two lateral teeth, intermediate and posterior tibiæ with a large sub-median tooth. Length 12-13 millim.

Habitat, Kodeicanel Mountains, Madras.

The white markings in this species are evidently liable to considerable variation, in one example the lateral border on the thorax is only represented by a small spot at the anterior angle, the discal spot on the elytra is divided into two, and the other spots are very small. In form and sculpture it approaches *C. sexpustulata*, G. P., but the mesosternal process is much shorter, the clypeus is less deeply emarginate, the thorax is more rounded at the sides, and the colour and position of the spots on the elytra is different.

NOTES ON THE NOTODONTIDÆ.

By THE REV. BERNARD SMITH.

No. 5.—*LOPHOPTERYX CARMELITA* AND *NOTODONTA DICTÆOIDES*.

Less cannot be said, than that *Lophopteryx carmelita* is one of the most beautiful of our Prominents. My paper on *Notodonta chaonia* (Entom. xxi. 36), elicited the fact that the species was not so exclusively southern as I had considered. It brought me the larva from Scotland. But *carmelita* is known to be a northerly

insect as well as a southern. Yet I have heard of no captures of late years except in Sussex. It is nowhere common.

The egg is white and conspicuous, yet I never heard of its being found. It is less than that of *Notodonta trepida*.

The larvæ as well as those of *N. chaonia*, and other Prominents, are occasionally cannibal, and in many localities it is not easily reared. Here on a chalky soil I have found no difficulty. The larva might be mistaken for that of *Notodonta trimacula*, but is stouter in the middle, and tapers towards the ends.

The moth pairs readily, and may be found paired generally till the morning. Probably, therefore, a search for the moth on palings or the branches of birch trees would be most successful early in the mornings of May.

I have never noticed a variety of this insect, but northern specimens are much smaller than southern.

Notodonta dictæoides is another interesting Prominent, and its range is from the Highlands to the New Forest. The egg is white, and resembles that of *L. carmelita*, turning almost black however before hatching. The larva is cannibal in its habits from early youth, and it is necessary to isolate them as far as possible. When large the yellow lateral stripe makes this larva easily seen by birds, and I have lost many by the birds drawing them through the muslin sleeves, when fed on the growing trees. The remedy is a double sleeve. This larva likes the shade.

Notodonta dictæoides, as with *N. dictæa*, is in some seasons double-brooded, at least partially. Perhaps one reason why this moth is still a rarity, is the tenacity with which the larvæ cling to the birch twigs. Hence many are wounded by the beating-stick, and still more escape capture. It is probable the larva should be searched for, and though the process is wearisome, it is worth the trouble. This larva seems less attacked by ichneumons than most others of this family.

It is supposed to feed exclusively on the birch, but I have heard that near Doncaster it is found on aspens. This, however, must be considered as the exception which only confirms and proves the rule.

Marlow, December 22, 1888.

NOTES UPON THE BRITISH PTEROPHORI.

BY RICHARD SOUTH, F.E.S.

Oxyptilus heterodactylus.

EVERY one interested in Pterophori will be obliged to Mr. C. A. Briggs for correcting the error first made by Dr. Mason, and subsequently perpetuated by me, in assigning *heterodactylus* to Haworth instead of De Villers. Without proof

that this particular insect of Haworth's is distinct from that to which De Villers gave the name of *heterodactyla*, there is, however, nothing in the rectification which can in any way affect Dr. Mason's conclusion as to the identity of *teucarii* and *heterodactylus*.

Stephens evidently considered the *heterodactyla* of De Villers identical with Haworth's insect of the same name, for in his Syst. Cat. Brit. Ins. ii. p. 231, No. 7628, we find it entered thus:—

25; *heterodactylus* (Sam. i. 35). Ph. Al. *heterodactyla*, Villers, E. ii. 535. Al. *heterodactyla*; the spotted black Plume (Haw. Pr. 39), Haw. 479. In Steph. Brit. Entom. Haust. iv. p. 377 (1834), however, Haworth's name is omitted, and the reference is only to De Villers and Steph. Cat.

Platyptilia zetterstedti.

By the courtesy of Lord Walsingham I have lately had the privilege of examining Zeller's type of *P. zetterstedti*. I cannot see that the specimen differs in any way from some examples of undoubted *gonodactyla*, and it certainly is not identical with the insect we know as *zetterstedti*.

In the March number of the 'Young Naturalist,' Mr. Briggs has been good enough to criticise my remarks on this species (*ante*, p. 29), and among other things he says that my now defunct *tæniadactylus* narrowly escaped from being called identical with *farfarella*. We are not told how he arrived at this conclusion, but it is quite clear that no ordinary process of putting two and two together would lead to such an egregious mistake. If I am correct in considering Zeller's *zetterstedti* and *farfarella* to be forms of *gonodactyla*, my *tæniadactyla* is not implicated in the 'bouleversement;' as it is not a variety of Zeller's *zetterstedti*, but of *nemoralis*, Zell., of which species I believe our pseudo *zetterstedti* to be a form. I am sure this was already the view taken by the majority of those who may have read my previous remarks on this species. I must, therefore, apologise to them for explaining that which, of course, they will think required no explanation.

Oxyptilus lætus, Zell.

It will, perhaps, be remembered that I recorded the capture of *O. lætus*, Zell., in N. Devon (Entom. xv. p. 35), and also that Mr. Barrett refers to the capture of undoubted examples of the insect at Folkestone (Ent. Mo. Mag. xviii. p. 178); but Mr. Briggs says in the 'Young Naturalist,' "Of *heriacii* and *lætus* no authentic records of captures in England exist." The author of this statement could not have carefully searched through the entomological journals, or he certainly would not have made any such assertion with regard to *lætus*.

12, Abbey Gardens, N.W., March 17th, 1889.

NOTES UPON CERTAIN PTEROPHORI.

By J. W. TUTT, F.E.S.

I SHOULD like to call Mr. South's attention to the following point in his 'Contributions to the History of the British Pterophoridae' (Entom. ante, p. 35), where he states:—" *Mimæseoptilus zophodactylus*, Dup. = *loewii*, Zell. Imago:—August. Larva:—September, in the flowers of *Erythræa centaureum*." I think that there can be no doubt that Mr. South wishes to teach the readers of the 'Entomologist' that the larvæ appear in the same year, but after the imago.

May I kindly ask whether Mr. South has ever bred imagos from the larvæ of *loewii* collected in September from the flowers of *Erythræa centaureum*?* or has any one ever seen the larvæ or pupæ the same year in the months following the emergence of the imagos? When I was at Folkestone in the middle of August, 1886, 1887 and 1888, Mr. Austin, of that town, was breeding *loewii* from *Erythræa* flowers, but the flowers were collected in the latter part of June and early July. This is the ordinary time that the larvæ are to be collected; they pupate throughout July and August, stay in the pupal stage about three weeks, and then emerge. These are, at any rate, the data I have noted. The following year, from June to August, the larvæ can be again obtained; but so far as I know, and so far as I can find out, from the time of emergence of *loewii* in August and September to the appearance of the larvæ again in June, we have an almost perfect blank, filled in only by the statement in Stainton's 'Manual,' of "Larva in September," and the same statement in Merrin's 'Calendar' (transcribed probably from the 'Manual'), to the effect that the imago occurs in July and the larva in September. I suppose we

* Mr. Tutt is correct in supposing that the description he refers to was taken from the larva I had in 1881. In 1887 I obtained two other larvæ on September 2nd; these agreed well with my earlier description, and appeared to be full grown. As soon as the opportunity of doing so occurred, I intended to take down a description of the pupæ, but just at the time I went away from home and forgot to take the *zophodactylus* larvæ with me. When I returned on October 5th, two imagines of the "plume" were out, one of which was dead and stiff. Hoping to renew acquaintance with this larva, and obtain at least another chapter in its life-history, I purposely refrained in my note on the species (ante, p. 35) from making public my failure in 1887. However, as Mr. Tutt appears to desire additional information on the point, I am in a position to assure him that larvæ did occur in September, both in 1881 and 1887. The omission of September, ? October, as dates for the perfect insect, was an unfortunate error on my part, which I especially regret, as it seems to have involved others than myself. I had been told that larvæ of *zophodactylus* were to be found in June or July, and my informant was good enough to promise me a supply, but they never came to hand. Mr. Porritt bred imagines from August 23rd to September 1st, from larvæ he received in the middle of August. Mr. Gregson and myself have had larvæ as late as September; therefore with the dates given on Mr. Tutt's authority, the lepidopterist would seem to have a good chance of finding larvæ of *zophodactylus* whenever *Erythræa centaureum* is in flower, and this is from June to September. I may add that I have taken imagines in the last week of August at Ventnor.—R. S.

may safely presume that Mr. South's reference to Mr. Leech's 'Pyrallides' (*ante*, p. 35) refers to the description which he (Mr. South) published ('Entomologist,' vol. xviii. p. 99), and where he writes:—"Larva in August and September, in flowers of common centaury." This I should have supposed was based on other authors. But Mr. South goes on, "I have a description of the larva, taken from a solitary example in 1881," &c. But surely this is the larva described more in detail (*Entom. ante*, p. 35), and to which Mr. South adds "September, in the flowers of *Erythræa centaureum*." Here then is the missing link. If Mr. South has got the life-history of this September larva, when it pupated, and in short, its history until it emerged in the August (his own date) following, we shall have learned something we do not at present know. The 'Manual,' in making the larva follow the imago the same year, is in error; the 'Calendar' is in error; but Mr. South has obtained a September larva, and might have cleared up the error, but he perpetuates it by saying, "Imago, August; larva, September." Mr. Gregson (*Entom.* vol. iv. p. 350), who gives the true life-history of *loewii*, mentioned that the larva in that particular season occurred as late as September, but the moths emerged the same year. Mr. Porritt also described the larva in the March number of the *Ent. Mo. Mag.* for 1884.

As far as I know the life-history of *loewii*, it amounts to this:—
 Larvæ:—May, June, July, and early August, in flowers of *Erythræa centaureum*. Pupæ:—July, August, and early September (hung up by abdominal segment among food-plant). Imagines:—Middle of August to middle of September. The remainder of its life-history is, I believe, unknown. Whether the imago hibernates and lays its eggs in spring, or whether they are laid in the autumn, are both points I have heard good lepidopterists give different opinions about. Nothing appears to be known as to the time that the larva hatches, but small larvæ may be found in June.

Like all the other plume larvæ that I know, those of *loewii* are very variable. I made the following note some time ago:—"Loewii larvæ vary very much; some have a red stripe, some pinkish, others with scarcely any trace of dorsal or other longitudinal markings. The pupæ vary almost to the same extent; some are green, others quite red, with intermediate forms."

Platyptilia gonodactyla = *farfarella*.—Mr. Charles Briggs, in the current number of the 'Young Naturalist,' has handled some of Mr. South's conclusions pretty correctly; but I should like to ask Mr. South whether *P. farfarella* was not separated from *gonodactyla*, rather because of the difference in time of emergence than from any difference in the imago.* If this is so, I think the

* Certainly not. Prof. Zeller took a specimen on May 29th (*Ent. Mo. Mag.* vi. p. 48).—R. S.

matter of identity was settled when I bred the second brood (vide Ent. Mo. Mag., vol. xxv. pp. 104—106).

Amblyptilia acanthodactyla and *A. cosmodactyla*.—Will Mr. South kindly say what are his reasons for placing these two species as one? * Mr. Porritt says, "I separated the larvæ quite easily before the moths were bred, at any rate the two forms of larvæ produce the two forms of the moth, and vide Ent. Mo. Mag. of November, 1886, and of December, 1885" (*in litt.*). Supposing it is a dimorphic species, does not the *onus probandi* rest on Mr. South's shoulders? Until Mr. South has reared the two species from the same female, I should prefer to look upon them as distinct.

Railey Villa, Westcombe Park, S.E.

NEW SPECIES OF CRAMBI FROM JAPAN AND COREA.

By J. H. LEECH, B.A., F.L.S., &c.

(PLATE V.)

As with the species described in last month's 'Entomologist,' the following new species have been compared with the National Collection, South Kensington, Mr. Moore's and Dr. Staudinger's collections; M. Ragonot, of Paris, our greatest authority on these groups, has also been kind enough to compare my types with his fine collection.

CRAMBUS ORNATELLUS, n. sp., Plate V., fig. 2.

♂. Primaries blackish brown; a longitudinal white streak, slender at the base, gradually increasing in width to the middle of the wing, where it is intersected by a line of the ground colour, its continuation beyond being represented by an ill-defined white patch, extending to the white submarginal line, which latter starts from the costa in an oblique direction towards outer margin, then forming a sharp angle turns in the opposite direction, and terminates on the inner margin. On the costa just beyond the middle are two short white oblique lines; between these and the submarginal is a short white streak also on the costa. Fringes dark brown, with some white scales below apex. Secondaries pale grey-brown, outer margin and costa broadly fuscous. Palpi white, with some blackish scales. Head, thorax, and abdominal junction white. Expanse, 20 mm.

One example taken by myself at Nagahama in July, 1886.

Closely allied to *C. alpinellus*, Hübn., but the hind margin of primaries is nearly straight and the apex is not produced.

* I cannot see any good and sufficient reason for separating them. The colour difference, either in the larval or perfect state, is not, in my opinion, of specific value, seeing that in all other respects the two forms appear to be alike in all the stages of which we have any knowledge. With regard to breeding one form from ova deposited by a female of the other form, I may say that I should not expect to rear the *cosmodactyla* form from a typical female, except such female was obtained in a locality where both forms occurred together; neither should I hope to see specimens of the type form among the progeny of a female *cosmodactyla* taken in a place where the type did not occur.—R. S.

Although agreeing superficially in colour and markings the latter are of a different character.

CRAMBUS ARGENTISTRIELLUS, n. sp., Plate V., fig. 11.

♂. Primaries golden yellow, silvery white along the inner margin and basal half of costa, several longitudinal silvery dashes margined with black on the disk, and a similar but longer dash runs parallel with inner margin; double silvery grey submarginal line elbowed below costa, and edged internally with brownish; black marginal line represented beyond the middle by three black dots. Fringes dark grey, thickly speckled with silvery scales. Secondaries whitish, suffused with fuscous over the discal area; fringes white tipped with grey, and preceded by a black line. Palpi white above, brownish along the sides and partly beneath. Expanse, 23 mm.

Two male examples taken by myself at Gensan in June, 1886, near to *C. hortuellus* and *C. striatellus*, but easily separated from either.

CRAMBUS STRIATELLUS, n. sp., Plate V., fig. 3.

Primaries yellowish brown, with several interrupted longitudinal black streaks, and some brownish oblique costal dashes; submarginal line whitish edged internally with brownish. The dark grey fringes are speckled with silvery, and have a black line at their base which is broken up into dots near the inner angle. Secondaries dark grey, with a slight violet tinge; fringes glossy whitish. Under surface fuscous-grey, pale yellowish along costa and outer margin of primaries. Palpi whitish, tipped and ringed with black. Expanse, 19—22 mm.

Four specimens received from Mr. Manley of Yokohama. Near to *C. hortuellus*, but separated at once from that species by the more decided character of marking.

CRAMBUS DISTINCTELLUS, n. sp., Plate V., fig. 1.

Primaries silvery white, with a few black spots forming an abbreviated basal line, and a series of black spots on the disk representing two angulated parallel lines; submarginal line brownish, curved near the costa and angulated towards inner margin. Fringes white, sprinkled with grey near inner angle. Under surface white, dusted with ochreous brown; inner half of secondaries and fringes of all the wings white. Palpi white above, brownish beneath and along the sides. Expanse, 21—28 mm.

I took five examples of this species at Hakodate in August, 1886. It is quite unlike any species with which I am acquainted.

CRAMBUS NIGRIPUNCTELLUS, n. sp., Plate V., fig. 10.

Primaries white, with some ochreous brown markings at apex; an ill-defined brown line crosses the middle of the wing from costa to inner margin, and another brown transverse line runs parallel with the outer margin, except towards costa where it curves inwards; a conspicuous elongated black spot on the disk has its outer extremity directed towards apex. Fringes ochreous, ornamented with silvery scales, preceded by a dark brown marginal line, on which there are two black dots near inner angle. Secondaries white, tinged with fuscous; fringes white, with a dark brown line at their base. Under surface of primaries whity brown, the whole of the disk clouded with fuscous; secondaries as above. Expanse, ♂ 16 mm., ♀ 24 mm.

An example of each sex taken by my native collector at Ningpo, July, 1886, and a male specimen by myself at Gensan, in July of the same year.

CRAMBUS PURELLUS, n. sp., Plate V., fig. 7.

Primaries glossy white; a brown inconspicuous discal spot; fringes white flecked with grey. Secondaries white, with a conspicuous black line narrowly edged internally with fuscous on outer margin. Palpi whitish. Under surface of primaries shining fuscous. Secondaries white edged along costa with fuscous. Expanse, ♂ 24 mm., ♀ 30 mm.

Four specimens taken by myself at Hakodate in August, 1886, near to *C. immaturellus*, Christoph.

CHILO GENSANELLUS, n. sp., Plate V., fig. 9.

♂. Primaries dark cinnamon-brown, with a transverse series of three black dots on the disk, and seven along the outer margin; on the external edge of these last are some silvery scales, which project into the dark grey brown fringes. Secondaries pale brown. Palpi blackish above, whitish beneath. Under surface of primaries fuscous, secondaries shining whitish grey. Expanse 23 mm.

One example taken by myself at Gensan in July, 1886; two specimens by native collector at Hakodate, June, 1887.

NEPHOPTERYX BICOLORELLA, n. sp., Plate V., fig. 5.

♀. Primaries, basal half pale reddish brown, darker towards inner margin; outer portion dark greyish brown; a dark brown line edged internally with whitish traverses the disk of the wing from costa, where it makes a slight bend, nearly to the inner margin; submarginal line wavy, pale brown. Fringes dark grey, intersected by a line of paler grey. Secondaries fuscous-brown. Expanse, 27 mm.

One specimen coll. Pryer, labelled Tokio.

This species is nearly allied to *N. insignella*, Mn.

ELAMOPALPUS BIPARTITELLUS, n. sp., Plate V., fig. 4.

Basal half of primaries chocolate, darker externally, and its limit bounded by a whitish band; the outer portion of the wing is pale chestnut, shading into fuscous-brown towards outer margin; submarginal line faint. Secondaries grey-brown, darker along the costa and outer margin. Fringes of all the wings dark grey-brown. Expanse, 20 mm.

One example coll. Pryer.

MELITENE BIFIDELLA, n. sp., Plate V., fig. 8.

♀. Primaries reddish brown, suffused with fuscous; basal third blackish, its external edge is bordered by a stripe of violet-grey, followed by a blackish band; central fascia blackish, broad, and much expanded towards costa, where it encloses a patch of violet-grey scales; marginal band blackish, separated from the central by an undulated line of the ground colour, and edged externally with violet-grey. Fringes dark grey-brown. Secondaries and under surface fuscous. Expanse, 23 mm.

One example coll. Pryer.

PROPACHYS FLAVIFRONTALIS, n. sp., Plate V., fig. 6.

♂. Fuliginous grey-brown, appearing darker between the veins. Secondaries slightly browner than the primaries. Head yellow, collar blackish, edged with yellow. Under surface fuscous-grey. Legs blackish, tarsi pale brown. Expanse, 36 mm.

I took two male specimens at Tsuruga in July, 1886, and my native collector a female example at Ningpo, in the same month of that year.

HUFNÄGEL'S TYPES.

By J. W. TUTT, F.E.S.

PROBABLY of the objections which were raised to the 'Entomologist' list of Lepidoptera, none was more serious than the fact that some of the names used were not able to be traced by even the most scientific lepidopterists in this country. To those who had previously used Staudinger's Catalogue, these names, the synonymy of which was so objectionable, and which had apparently been transcribed direct from his Catalogue, did not come as such a striking innovation, as to those whose knowledge of nomenclature did not extend beyond the limits of one of our ordinary "Exchange Lists." Only last year a really good lepidopterist, who knew more of synonymy than I did, asked me why I used Hufnäger's names, and whether I had ever seen the "Magazine" that was supposed to contain them. I was obliged to confess that neither the "British Museum Library" nor our "Entomological Societies' Libraries" gave me any help, and that, so far as I knew, a copy did not exist in Britain. However, as it was absolutely necessary in getting out my "Variety" papers for the 'Entomologist' to know what the types were like, I wrote to Dr. Staudinger for help; but the attempt was, as many of my friends prophesied, a failure. However, I obtained the assistance of my kind correspondent Herr Hoffmann, of Hanover; and he, with the aid of a Berlin naturalist, was able to get me copies of the description from the library there. The descriptions are—like all those of the same age—poor, but equally good (or bad) with others, the acceptance of which is not questioned. The following are the first three:—

(1) 62. P. 308. "*Phalena monoglypha*. Der Treiber." Description:—"Theils bläulich, theils hell theils dunkel grau, mit einem lateinischen W an dem hintern Rande." Locality:—"In den Fugen der Zäune u. Bäume." Time of appearance:—"Junius und Julius." Size of moth:—"Von der zwoten grösse." Common or rare:—"Setten."

(2) 96. P. 414. "*P. matura*. Die Glanzmotte." Description:—"Braungrau mit weissen u. blassgelben Zeichnungen, die meistens braun gerandet sind. Die Unterflügel blassgelb mit einen breiten braunen Rande." Locality:—"Auf den Blättern der Eichen." Time of appearance:—"Julius." Size of moth:—"Von der zwoten grösse." Common or rare:—"Sehr setten."

(3) 97. P. 416. "*P. cursoria*. Der Rothbart." Description:—"Gelblichgrau mit 2 braunen ausgeschweiften u. ausgezackten u. 2 grauen geschläugetten Ruerstreifen." Locality:—"In den Fugen der Zäune."

Time of appearance:—"Junius." Size of moth:—"Von der dritten grösse." Common or rare:—"Etwas setten."

A running translation of these would be:—

1. *P. monoglypha*. "Partly bluish, partly light, partly dark, grey, with a Latin W on the hind margin." "In the rifts of fences and trees." "June and July." "Of the second size." "Rare."

2. *P. matura*. "Brownish grey, with white and light yellow markings, which are generally surrounded with brown. Hind wings light yellow, with a broad brown margin." "At the leaves of the oaks." "July." "Of the second size." "Very rare."

3. *P. cursoria*. "Yellowish grey, with two brown curved and toothed, and two grey wavy transverse lines." "In the rifts of the fences." "June." "Of the third size." "Rather rare."

The "partly bluish" of *monoglypha* refers, I should imagine, to the slight iridescence we find on some specimens.

Matura "at the leaves of oaks." This is strange, but probably the few specimens ("very rare") that Hufnägel had seen were attracted thither by "honey-dew."

Cursoria. "June." A very early date. I doubt whether it ever occurs in Britain so early, although I have captured its congener, *tritici*, as early as June 29th and as late as September 12th, at Deal.

My only idea of publishing these descriptions is to convince some of my friends that Hufnägel's descriptions really exist, and there is little doubt in my mind that Staudinger was right in making use of them.

Westcombe Park, March 7, 1889.

LIFE-HISTORY OF *GEOMETRA PAPILIONARIA*.

By GEORGE J. GRAPES.

In expanse of wing and beauty this Geometer is undoubtedly pre-eminent among our emerald moths, and well worth the trouble of rearing, not only on this account, but on that of its belonging to a somewhat numerous species of Lepidoptera that pass the winter in a larval state.

I have several times succeeded in rearing this insect through all its phases of existence, but not till lately have I taken any real interest in noting its life-history.

The ova are laid chiefly on birch early in July. At first they are of a pale straw-colour, changing in about ten days to orange-red, and to a bluish black on the emergence of the caterpillar, which occurs between the middle and end of the month.

The larva is black when first hatched, and about an eighth of an inch in length. Before hybernation the young caterpillars feed up on the cuticle of the foliage, the denuded parts having a

very pretty reticulated appearance. After hybernation they devour both cuticle and veins. The larva of the female is about a quarter of an inch in length, of a dull orange colour, with its anal and middle segments reddish brown; that of the male is paler, with less orange, and frequently wholly of a dingy greyish hue. In autumn, when the trees begin to assume those well-known sombre tints so characteristic of an English landscape, they, contrary to some authors, cease to feed, and settle for their long winter sleep on the branches of various trees; and in colour, shape, and general appearance strongly resemble when hybernating on birch, and probably on other trees, rudimental branchlets, for which, at first sight, they may be easily mistaken. This resemblance is, however, only fully acquired when the shelter of the foliage is gone, and evidently forms their chief protection against the ravages of insectivorous birds. During hybernation they become much reduced in size, and then present a very shrivelled appearance, particularly when seen by the aid of a lens, which also discloses a reddish tinge, not otherwise observable. The caterpillars may be obtained in September by beating birch (*Betula alba*), hazel (*Corylus avellana*), and, I am informed, alder (*Alnus glutinosa*), &c.; but the moth seems to prefer depositing her ova on dwarf and stunted birches, especially those lopped or broken, situated in sheltered positions. Such trees are less affected by tempest, and the parent, in selecting them as nurseries for her offspring, would appear to be impelled by exceptional instinctive powers, in support of which I may state that I have rarely ever beaten the larva from tall birches, and then only from the lower branches. The larva of this insect, in common with other hybernating species, such as *Lasiocampa quercifolia*, *Metrocampa margaritaria*, *Boarmia repandata*, *B. rhomboidaria*, *B. roboraria*, *Hylophila bicolorana*, with which I have had experience, exhibit the same restlessness on warm days in early spring, and in the absence of leaves feed on buds and tender twigs.

About the middle of April a perceptible change takes place in the hybernating hues, which gradually by a series of moults, during which the autumnal tints more vividly reappear, intermingled with yellowish green, give place to that lovely and delicate shade of green acquired by the adult larva,—a change singularly coincident with that which the foliage undergoes from the bursting of the bud to the full-expanded leaf; and here at this, the third and most interesting period of its larval state, resemblance in colour, no doubt enables it frequently to elude the vigilance of its enemies.

The common form of the larva is emerald-green, with a broad and not very regular reddish brown dorsal stripe, and with the segments humped, as follows:—Second and fourth segments minutely humped; third and twelfth uni-humped; third hood-

shaped; sixth, eighth, and ninth bi-humped; seventh bifid-humped, and most conspicuous of all the humps. There is a very beautiful variety of the male larva, of which I was not previously aware, the ground colour being of a pale yellowish green, with a broad dorsal reddish brown stripe, and two lateral rows of lozenge-shaped blotches, two on each segment, of same colour as stripe. This variety, contrary to the common form, retains its colouring all through the larval state, and exactly simulates the reddish brown catkins of the birch, so much so that three or four catkins, attached to the upper surface of a leaf, so deceived me that I imagined I had more larvæ of the variety than was really the case. I observed that the ground colour of the pupa of the variety is of a creamy white, slightly suffused with the palest green, and that the wing-cases and segments of the body of imprisoned imago are sharply defined by dark green; also that moths bred from such pupæ are of an intenser green than those of the common form.

It is noticeable that the larva of the common form, pupa, and perfect insect are all green; and the moth is probably a unique instance of a lepidopterous insect preserving the same colour throughout all its metamorphoses.

The perfect insect often attains a maximum size of about two and a quarter inches, and in localities where it abounds it may be easily netted at dusk about the end of July, though it is somewhat a swift flyer.

Berkeley Villa, Charlwood Road, Putney, S.W.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

PIERIS RAPÆ IN FEBRUARY.—On February 28th, when visiting in my parish, I saw a white butterfly fluttering to the ground in one of the streets of Portlaw. The insect was soon captured, and I was much astonished to find a perfectly fresh specimen of the above species. The sun was very hot, though last night was the coldest this winter, the thermometer registering 12 degrees of frost.—(Rev.) WILLIAM W. FLEMING; Clonegam Rectory, Portlaw, Co. Waterford, February 28, 1889.

VARIETY OF PIERIS BRASSICÆ.—I have recently seen in a very old collection a curious variety of this species. The ground colour is sulphur-yellow as in the var. *aurea* of *Pieris rapæ*. It is the best variety of this species that has come under my notice, the next best being in the collection of the late Nicholas Cook, the wings in the latter being suffused with smoky. In Mr. Gregson's collection was one with the veins partly bright green. All these specimens are males. Mr. Hardings, of Shrewsbury, sent me several specimens, fed up on canary creeper, with the fringes bright yellow.—S. L. MOSLEY; Beaumont Park Museum, Huddersfield.

DEILEPHILA GALII IN KENT.—An unrecorded capture of *Deilephila galii* was made here in August last, flying about sweet williams in early twilight.—ARCHIBALD GOSTLING; Woodfield, Gravesend, March 19, 1889.

CHÆROCAMPA CELERIO NEAR TAUNTON.—A specimen of *Chærocampa celerio* was caught in the neighbourhood of this town last year. I don't remember hearing that a specimen has been caught in this district before.—J. BUCKLAND, Jun.; 13, East Street, Taunton, March 11, 1889.

SMERINTHUS OCCIDENTALIS IN COLORADO.—With reference to my paper (Entom. xxi. 298, *et seq.*), I should mention that the *Smerinthus* found at Cottonwood Springs is confirmed as *S. occidentalis*. Mr. H. W. Nash writes that it is very common at Pueblo, the larvæ feeding on cottonwood. On page 303, the var. of *Quercus undulata* should be *cinerior*. "*Ilybius picipes*, Ki. b.?" on page 304, now proves to be *Agabus tristis*, Aubé. Two other species of *Agabus* have been collected in Custer Co., but these are in the western part of the county, viz., *A. parallelus*, Lec., and *A. intersectus*, Lec.—T. D. A. COCKERELL; West Cliff, Colorado, December 21, 1888.

HYBERNATING LARVÆ.—I have some larvæ of *Uropteryx sambucaria* (Entom. ante 21) feeding on ivy in a bottle of water in a room with no fire. They have been feeding and slowly growing for four months. I think this larva is usually easily reared.—S. ROBINSON; Clapfield Terrace, Winchmore Hill, N., January 14, 1889.

EARLY APPEARANCE OF PHIGALIA PEDARIA.—I took a male *P. pedaria* off a Chester gas-lamp on the evening of January 19th. I was not surprised, as our almost uninterrupted warm winter brought primroses, violets, and even fruit trees into bloom at Christmas.—J. ARKLE; 2, George Street, Chester.

FOOD OF NYSSIA ZONARIA.—Last spring Mr. Arkle of Chester sent me some larvæ of *Nyssia zonaria*, with instructions to feed them on any of the willow tribe. I tried them with several species, including willow, for a week but with unsatisfactory results. Then I referred to Stainton's 'Manual of Butterflies and Moths,' and there found yarrow was given as their food-plant, which I gave them and saw they ate it very readily. I have since acquainted Mr. Arkle with my experience, thinking he might like to mention yarrow in addition to the willows another time. In reply he suggested that I might send a note to the 'Entomologist,' as *zonaria* had never fed on yarrow with him nor with any of his acquaintances. It was a fine healthy plant and growing in the sun I fed them from, which may make some difference.—F. MILTON; 164, Stamford Hill, N., January 19, 1889.

AMPHIDASY BETULARIA, BUFF VAR.—A communication from Mr. J. Rodgers of Oldham (Entom. 49) refers to a black variety of *Amphidasys betularia* having been taken in copulâ with a buff variety of the same species. I was glad to see this note, for although the black variety is common in this district, to capture a buff in copulâ with a black one is remarkable. It is now a good many years since the Middleton entomologists were breeding this buff variety, and I often think it was a great pity that no record of this singular variety should have been made. I believe some are still in the hands of Councillor J. Thorpe of Middleton. It would be interesting to know something of this remarkable strain, and whether it has been totally lost.—JOSEPH CHAPPEL; 29, Welbeck Street, Chorlton-upon-Medlock, Manchester, February 19, 1889.

STIGMONOTA RAVULANA IN RENFREWSHIRE.—In June, 1888, I was in company with my friend, Mr. Watson, collecting *Coccyx cosmophorana* in Renfrewshire, when one of us took *Stigmonota ravulana*.—J. B. HODGKINSON; Ellerslie, Ashton-on-Ribble, Lancashire, February 23, 1889.

LATE LEPIDOPTERA IN 1888.—In 1888 *Euchloë cardamines* was out so late as June 25th in South Wales. The cold and wet summer appeared to have affected the second emergence of *Lycæna icarus* on the Cotswold Hills in Gloucestershire. They were only generally coming out so late as September 12th, and this also was the case with *L. astrarche*, the former were in the greatest profusion in the second week in August, 1887. On December 5th, a specimen of *Plusia gamma* came to light, and throughout November many came to ivy bloom in this district. With regard to larvæ, on October 1st I found a specimen of *Acronycta leporina*, feeding on sallow; this fed well until late in November, when it died in going through its moulting. The long silky hairs in this example were of canary yellow, and the body dark in colour. One specimen taken in July, feeding on birch, was pale green with white hairs. On November 15th a larva of *Sphinx ligustri* was still feeding; as also were on November 23rd many larvæ of *Pieris brassicæ*.—T. B. JEFFERYS; Clevedon.

BACTRA FURFURANA IN NORFOLK.—Perhaps the fact may be worth recording, that about a dozen specimens of *B. furfurana* were taken last August by my brother and myself while collecting on a piece of marshy land in West Norfolk. The insect occurred fairly commonly, and I have no doubt many more might have been secured if we had wanted them.—GEORGE BALDING; Ruby Street, Wisbech.

PRIONUS CORIARIUS, L.—Respecting the occurrence of *P. coriarius* near London (Entom. 77), I do not consider the beetle at all rare in the Epping Forest district, as some dozen or more examples have in recent years been submitted to me for identification; indeed, two specimens came under my notice last year. Four were exhibited by me in November, 1887, at the Exhibition held by the South London Entomological and Natural History Society; all of these were from Loughton. Seven specimens were also shown at the exhibition of the City of London Society, on March 21st, 1889, many being of comparatively recent capture. The best time to search for it is during the first and second weeks in August, on the trunks of oak-trees.—G. A. LEWCOCK; 73, Oxford Road, Islington, N., March, 23, 1889.

LEPIDOPTERA NEAR LEICESTER.—I have taken the following Lepidoptera which are not common in this district:—*Sesia asiliformis* (*cynipiformis*), caught on ragwort at Bradgate Park, August 7th, 1888; *Phigalia pataria*, female, hatched from pupæ, January 20th, 1889, found January 13th, 1889, at root of an oak; *Amphidasys strataria*, caught March 14th, 1888, in Leicester; *Cidaria silaceata*, caught June 13th, 1888, at Bradgate; *Pericallia syringaria*, caught August 6th, 1888, in a private garden near Leicester.—C. B. HERDLY; Stoneysgate Road, Leicester, January 23.

NOTES FROM CANNOCK CHASE.—In warm seasons *Eupithecia linariata* is, I believe, said to be double-brooded. This can hardly be the case with *E. pulchellata*? I took a lot of larvæ of the latter at the end of July last, and from them emerged two imagines on the 27th and 29th of August.

This is the more extraordinary as last year was anything but a warm season. I have examined the rest of the pupæ, which were kept out of doors, and found them all healthy: so I am inclined to look on the occurrence as a freak of nature. I took a specimen of *Porthesia similis* on October 2nd, and *Xylophasia monoglypha* was common about that time. I beat a larva of *Dicranura bifida* from birch on September 13th last; both the food-plant and the time of year being extraordinary. Poplar abounds in the neighbourhood, but I have never taken the insect on the Chase before. I would suggest that the birch-feeding larva of Ochsenheimer and Freyer, mentioned by Mr. Kirby (Entom. xxi. 275), is that of this insect. At any rate their description is more applicable to *D. bifida* than to *D. bicuspis*. I took larvæ of *Acronycta leporina* from birch, alder, and poplar, the latter tree produced the yellow var. of the larva only. The best of the imagines taken last year were *Argynnis aglaia*, abundantly, *Hepialus sylvanus*, also common. *Porthesia chrysorrhæa*, a rare insect in that district. *Acronycta leporina*, *A. rumicis*, *Neuronia popularis*, *Hydræcia nictitans*, *H. micæa*, *Gortyna ochracea*, *Caradrina alsines*, *C. taraxaci*, *C. morpheus*, and *C. quadrinotata*. *Miana literosa*, *Orthosia suspecta*, *Polia chi*, *Noctua glareosa*, *N. augur*, *Amphipyra tragopogonis*, *Hadena protea*, *H. glauca*, *H. dentina*, and *H. contigua*, while *Plusia gamma* was the insect of the year, as it swarmed everywhere. *Amblyptilia acanthodactyla* was to be taken flying over the heather blossoms. I must not leave out *Calocampa solidaginis*, concerning which I can endorse Mr. Thorneill's remarks; and I feel sure any one searching the dried twigs, sticks, &c., on the ground in the localities where this insect is found, will be amply rewarded; as not only will he get them in good condition, but he will be astonished at their abundance. I beat from birch, besides those larvæ enumerated above, some of *Lophopteryx camelina*, *Notodonta dictæoides*, *N. dromedarius*, *Drepana lacertinaria*, and *D. falcataria*, and a lot of others. Poplar yielded *Notodonta dictæa* in plenty, with *Smerinthus populi*, *Dicranura vinula* and *Acronycta megacephala*. From Scotch fir I got *Panolis pini-perda*, *Eupithecia indigata*, &c., and I saw a larva of *Acronycta alni* beaten from a birch tree on the Chase. I am now investigating that dreaded enemy of the entomologist commonly called "grease," and would be much obliged if any reader of this would send me *abdomens only* of moths that have greased, those of large-bodied moths (e.g. *D. vinula*) preferred. I will gladly pay postage.—R. FREER; St. Mary's Hospital, Paddington, W.

NEW FOREST NOTES.—During the latter half of July, 1888, part of which time I was accompanied by my friend Mr. H. T. Dobson, several species of Lepidoptera were found in profusion in the neighbourhood of Brockenhurst, notably *Limenitis sibylla*, which occurred more or less commonly in all the enclosures. At Hurst Hill, so many as twenty specimens were counted upon one bramble bush. We also observed that they were much more easily captured than on any of our previous visits to this district. Later on *Argynnis paphia* was as abundant as usual, but the variety *valesina* was seldom met with. *Thecla quercus* was plentiful but local. By far the greater proportion of those observed were crippled, helplessly fluttering on the bracken. *Vanessa polychloros* had not yet emerged, but the larvæ must have been plentiful enough, judging from the traces left on the sallows. Both *Argynnis aglaia* and *A. adippe* were scarce. One fine pale *Apatura iris* was taken at rest on the fern; this specimen had evidently only

recently emerged, and was the only one seen. Sugar attracted a large number of common things, *Caradrina alsines* absolutely swarmed. Among other species were *Noctua brunnea*, *N. triangulum*, *Aplecta prasina*, *A. nebulosa*, *Leucania turca*, *L. conigera*, *L. comma*, *Tryphæna fimbria*, *Epunda viminalis*, *Nola confusalis*, *Calligenia miniata*, and *Macaria alternata* (one example). Neither *Catocala promissa* nor *C. sponsa* had put in an appearance before our departure. Although many larvæ were abundant in the Forest in June, it was not the case from the middle to the end of July, as larva-beating turned out very unprofitable. The only species worth mentioning which fell by our united exertions were *Amphidasys strataria*, *Ennomos erosaria*, *Psilura monacha* (very commonly), *Notodonta trepida* (one specimen), *N. trimacula* (three examples only), *Asphalia flavicornis*, *A. ridens* (nearly all ichneumonid), and *Hoporina croceago*. By digging pupæ, *Xylina rhizolitha* and *Petasia sphinx* were obtained. *Nemeophila russula* (both males and females) were freely taken on the heath. The dearth of Geometers on the wing at dusk was particularly noticeable. I have omitted to mention the capture of a very large dark form of *Boarmia abietaria*, a specimen of *Epinephele ianira*, with partially bleached hind wings, and a dark variety of *Argynnis adippe*.—ALFRED T. MITCHELL; 5, Clayton Terrace, Gunnersbury, W., January 12, 1889.

LEPIDOPTERA OF PORTLAND—CORRECTIONS.—Kindly make the following corrections in "A Year's Work in Portland" (Entom 56):—Instead of *Phycis ornatella*, read *P. adornatella*. Instead of *Acidalia ochrearia*, read *Aspilates ochrearea*. For *A. trigeminata*, read *A. dimidata*. For *S. phæoleuca*, read *mercurella*, var. *portlandica*. Erase *O. parvidactylus*, add *Crambus salinellus* and *L. microdactylus*.—C. E. PARTRIDGE; The Castle, Portland, March 15, 1889.

"MIMICRY" AND "PROTECTIVE RESEMBLANCE" IN INSECTS. — The various guises which insects develop in relation to their surroundings is one of the most interesting of their characteristics which can occupy the attention of observers in the field. Mr. Scudder's article in 'The Atlantic Monthly Magazine' for February, 1889, entitled 'Butterflies in Disguise,' bears testimony to the increasing popularity of the treatment of such subjects. Without being too technical for the general reader, Mr. Scudder has, as might be expected, presented a thoroughly reliable account of some of the more remarkable devices, by means of which butterflies secure greater immunity from their foes. It is, however, rather to be regretted that he omits to distinguish between the *two different kinds* of protection to which they have resort. Although it may be true that the means by which the end is attained is primarily the same in each case, there is so marked a distinct difference practically, and also in idea, between the *active* conditions which, in the case of mimetic species, permit certain species to assume the appearance in outer garb of species of quite different genera, and the *passive* conditions under which, with the operation of natural selection, many other species acquire so close a resemblance to their usual lodgment, that a distinction should always be made, by the employment of different terms of expression. The distinction has always been maintained by such writers as Wallace and Bates,—the first discoverers of these forms of protection,—Meldola and Poulton, but it is still quite usual, as I have frequently noticed, for writers on the subject to confuse the ideas, to the

detriment of the points they have dealt with. I have, therefore, thought it would be well to call attention to the distinction. There is objection, no doubt, to the introduction or change of terms already in use, but I nevertheless think it would be an improvement to definitely separate the two classes (active and passive) under the more precise terms—*mimicry* and *simulation*. The latter term has the advantage of being a single word, and is besides more expressive of the difference required to be implied.—WILLIAM WHITE; 4, Mecklenburgh Square, W.C.

SIREX IN NORTH WALES AND CHESHIRE.—I saw a fine specimen of *Sirex gigas* at Bettws-y-coed, N. Wales, on September 17th, 1888, which was flying about the railway station, and finally settled upon a man's arm, causing no little sensation among the bystanders, who took it to be a very large hornet, or something worse. I should imagine that the specimen must have been a genuine native of the district, as there is much timber about, and certainly no need for foreign importation. I may also mention that *Sirex juvencus* was for many years established in a small fir-wood at Rock Ferry, Cheshire, where I frequently saw specimens; I have not visited the locality lately, so cannot say if the species occurs there still.—WILLOUGHBY GARDNER; 18c, Exchange, Liverpool.

SIREX JUVENCUS IN LONDON.—My insect, referred to by Mr. E. R. Dale (Entom. 17), I think must have come from one of the factories or timber-yards in the neighbourhood. Some years ago I caught three examples of *Sirex gigas* in a pianoforte factory at Wood Green, where a quantity of pine timber was used, but not being then a collector I destroyed them.—S. ROBINSON; Clapfield Terrace, Winchmore Hill, N.

DOLOMEDES FIMBRIATUS IN IRELAND.—A few years ago, when searching for the rare little water-snail, *Limnæus involutus*, Harv., in the small lake which lies on Cromagloun Mountain, above the Tower Lodge, I met with a large and handsome spider, which I was not able to capture, and I suppose it then escaped into the water. But, on visiting this lake a second time with some friends, we succeeded in capturing the spider, which, as I anticipated from what I had seen of it, proved to be the rare and local species, *Dolomedes fimbriatus* (Clerck), long known in the fens of Cambridgeshire, but which I believe I was the first to find in Ireland.—A. G. MORE; 74, Leinster Road, Dublin.

NEWSPAPER ENTOMOLOGY.—Now that the "Institute of Journalists," which was lately paraded before the public with such ceremony, has commenced work, it is to be hoped that a little elementary science-teaching will be impressed upon its members. We have on several occasions given examples of "Newspaper Entomology," and here is another, showing the necessity for some attention among "reporters" to more exact definition of such words as "species." The London 'Daily Chronicle,' of Feb. 19th, 1889, in reporting a lecture by the late Rev. J. G. Wood upon "Ants," says he "spoke chiefly of that wonderful species of ants known as the Hymenoptera;" again, "at one period of the year there appeared some 50,000 small bees, which were incessantly at work."—JOHN T. CARRINGTON.

ERRATUM.—Page 77, line 28—29, for "the part if any," read "the vast if any."

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—March 6, 1889. —The Rt. Hon. Lord WALSLINGHAM, M.A., F.R.S., President, in the chair. The Rev. W. F. JOHNSON, M.A., of Armagh; the Rev. C. F. THORNEWILL, M.A., of Burton-on-Trent; and Mr. C. R. STRATON, F.R.C.S., of Wilton, were elected Fellows. Mr. F. P. PASCOE exhibited several specimens of the Saüba Ant (*Ecodoma cephalotes*), from Pará, carrying portions of dried leaves. It seemed questionable whether the leaves were collected by the Ants for the purpose of making their nests or for the sake of some fungus which might be growing on them. Mr. JENNER-WEIR exhibited, and read notes on, specimens of a Butterfly (*Tirumala petiverana*), from Mombaza, Eastern Africa. Mr. J. H. DURRANT exhibited a living larva of *Cossus ligniperda*, which had entirely lost its ordinary colour and had become first pink and then white. He attributed the change, and subsequent loss, of colour, to the fact that it had been deprived of its natural food and fed for eighteen months on pink paper, with which the box in which it was kept was lined, and subsequently on white cardboard. Mr. M'LACHLAN remarked that the most extraordinary peculiarity about this larva, in addition to the loss of colour, was the absence of the usual odour of *Cossus*. Lord Walsingham observed that it was questionable whether the colours of larvæ were dependent on the colours of their surroundings, or whether they were affected by the contents of the intestinal canal. Prof. MELDOLA said that the caterpillar exhibited having eaten the pink paper had most probably become dyed by the colouring matter, and he did not think the observation had much bearing on the question of the protective colouring of caterpillars. It was well known to physiologists that certain dye-stuffs could be introduced into the tissues of animals by mixing the colouring matters with the food, and paper was frequently stained with coal-tar dyes such as eosin, magenta, &c., so that it was simply a case of direct dyeing of the larva. Mr. W. WHITE observed that two extreme forms of a larva might often be found feeding side by side on the same tree or shrub, so that the colour of a larva could not be altogether governed by the colour of its food. Mr. B. A. BOWER exhibited a specimen of *Parasia neuropterella*, bred from heads of *Centaurea scabiosa*, and said he believed the species had not been previously bred. He also exhibited series of *Coleophora olivaceella*, *C. solitariella*, and *Laverna subbis-trigella*. The President remarked on the beautiful condition and setting of the specimens. Mr. WHITE exhibited a series of male and female specimens of *Orgyia thyalina*, belonging to Mr. LEECH, and obtained by the late Mr. H. J. S. PRYER in Japan. Some of the females had their wings fully developed, and some of them were semi-apterous, as is usual with the females of this genus. Mr. WHITE remarked that he knew of no other species of the genus in which the females had fully-developed wings. Lord Walsingham, Prof. Meldola, and Mr. R. SOUTH took part in the discussion which ensued. Lord Walsingham exhibited specimens of preserved larvæ of *Eupithecia extensaria*, from King's Lynn, Norfolk; also a preserved larva of *Smerinthus ocellatus* and one of *Sphinx ligustri*. The larva of the last-named species was a variety, and the President remarked that it was the only one of this species he had ever seen. The Secretary read a communication from the Rev. Dr. WALKER, announcing his intention of making an expedition to Iceland this year, from the 23rd June to the 29th July, and asking that any entomologists who might wish to accompany him would send him their

nines. Mr. Gervase F. Mathew communicated a paper entitled "Descriptions and Life-Histories of new species of Rhopalocera from the Western Pacific."—H. Goss, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*February 28th, 1889.* T. R. Billups, F.E.S., President in the chair. Miss K. Hinchliff, of N. Devon; Messrs. J. F. Perry, of Birmingham; A. Nott, of Brixton; H. More, of Rotherhithe; G. J. Randall, of Brixton; W. H. McLachlan, of Clapham; and J. Smith, of Plumstead, were elected members. Mr. R. Adkin exhibited *Anerastia lotella*, from Forres, Norfolk, and Kent; *Dioryctria abietella*, from Forres and Kent; *Crambus dumetellus*, from Forres, with *C. pratellus*; and *C. dumetellus*, from Kent, and *C. erucellus*, for comparison; and called attention to the close resemblance of the Forres *dumetellus* to the Kentish *pratellus* in colour and size, but that the markings were clearly those of *dumetellus*. In answer to Mr. Tugwell, Mr. Adkin stated that the specimen of *D. abietella* from Kent, was taken within a few miles of Deal, among a clump of about twenty fir-trees. Mr. Robinson exhibited varieties of *Agrotis segetum* and *A. exclamatoris* from Hunts. Mr. Manger, Coleoptera from Darjeeling, India; and Mr. Billups, over forty species of Arachnida, including three rare and local species, *Heliophanus flavipes*, *Ballus depressus*, *Pachygnatha degeeri*.

March 14th, 1889.—John T. Carrington, F.L.S., Vice-President in the chair. Mr. A. Horne, of Aberdeen, was elected a member. Mr. Percy Kuss exhibited a large number of species of Lepidoptera taken in the neighbourhood of Sligo, including *Aporophyla lutulenta*, var. *luneburgensis*, and many other local forms and varieties. Mr. Adye, series of *Dasyampa rubiginea*, and varieties of *Xanthia flavago*, taken in Hampshire. Mr. R. South, a curiously coloured specimen of *Zygæna filipendulæ*, and what he thought was a variety of *Hadena dentina*, both received from Mr. Baxter, of St. Ann's-on-Sea. Mr. R. Adkin, two dwarfed specimens of *Lycana corydon*, an underside of the male of *L. icarus*, with the black central dot of the lower of the two basal spots on the superior wings absent, and the outer light ring elongated; also specimens of *Endotricha flammealis*, *Scopula ferrugalis*, and *Rhodophæa marmorea*, all from the Sussex coast, 1888. The Secretary read a note from Mr. T. D. A. Cockerell, on *Pyractomena borealis*, and an aberration of *Dermestes fasciatus*, having the left elytron grey below the grey band, almost as grey as the band itself, with but little black marbling, the right elytron below the band black, with a trace of pale marbling, probably this was due to partial atavism. Mr. Tugwell read a paper "Practical Hints on breeding Macro-lepidoptera," upon which an interesting discussion ensued.—H. W. BARKER, *Hon. Sec.*

CITY OF LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—An exhibition in connection with this Society was held on March 21st last, at the Albion Hall, London Wall. The entomological exhibits were very varied, and of a highly interesting character. A prominent feature of the exhibition was the great display of Coleoptera, which comprised representatives of nearly all the British species. The groups Rhynchophora and Phytophaga were contained in Mr. E. A. Newbery's exhibit; while Mr. Cripps showed Geodephaga; and Mr. G. A. Lewcock, the genera *Necrophorus* and *Silpha*, and 32 species of Longicornia. Mr. Jarvis exhibited a typical collection of British Coleoptera and other entomological orders. Mr. Milton also exhibited Coleoptera, a case of dragonflies preserved in their natural colouring, also several species of Orthoptera. A wasp's nest,

obtained from Southgate by Mr. Battley, attracted much attention; as also did Mr. Bellamy's Asiatic Lepidoptera and Coleoptera, and Mr. R. W. Thompson's collection of butterflies from Alabama. Messrs. Cooke and Ashmead showed fine examples of Exotic Lepidoptera. Mr. Cooke also contributed a bred series of *Acronycta alui*, *Eugonia autumnaria*, and a specimen of *Noctua subrosea*. Mr. J. A. Clark's case contained some extraordinary varieties of *Triphæna comes*, *Asphalia flavicornis*, &c., from Scotland. Mr. G. Hollis exhibited examples of *Emydia cribrum*, *Drepana harpagula*, and a specimen of *Chærocampa nerii*, captured on London Bridge, in October, 1888. Dr. Sequiera's collection of insects taken in the New Forest last season, included *Argynnis paphia*, var. *valesina*, &c. Mr. O. C. Goldthwaite's case contained vars. of *Boarmia repandata*, nearly white, *B. rhomboidaria*, &c. Among the numerous varieties exhibited during the evening may be mentioned a black form of *Limenitis sibylla*, by Mr. H. Conquest; *Epinephele hyperanthes*, devoid of ocelli on upper wings, by Mr. C. Levett; *Cymatophora or*, by Mr. Mellor; and a large number of *Angerona prunaria*, by Messrs. Hockett, Mera, and Williams. The life-histories by Mr. Pearson were arranged with great care and neatness. Mr. G. Bryant's preserved larvæ of *Argynnis adippe* were also remarked in this department. Other exhibitors were Messrs. Gates and Boden, with Micro-Lepidoptera; Mr. Hawes, &c. Several drawers containing the Society's collections of Lepidoptera were also on view.—E. H. HAWES, 16, Raveley Street, N.W.; G. A. LEWCOCK, 73, Oxford Road, N., Joint Hon. Secs.

REVIEWS.

Monograph of the Sphingidæ of America, north of Mexico. By JOHN B. SMITH. American Entomological Society, Philadelphia. 1888.

WE find that Mr. Smith has treated eighty-three species as Sphingidæ, inhabiting temperate North America, sixteen being Macroglossinæ, eighteen Chærocampinæ, forty-one Sphinginæ, and eight Smerinthinæ. The work is very complete, including tables of genera and species, descriptions of the insects and, where known, also of the earlier stages, range of occurrence, notes on variation, bibliography, &c. In looking through the work one cannot help noting how little is known of the earlier stages of a large proportion of the American Sphingidæ, which is remarkable. Our "cousins" have the pleasure of discovery before them. There are ten plates illustrating this monograph, nine and a half being devoted to the illustration of the genital organs of various species, and the remainder to venation in certain genera. We have to congratulate the American Entomological Society upon issuing this monograph. Mr. Smith being so well known as an entomologist, and an authority upon the group, the work will remain long the standard of reference upon this subject.—J. T. C.

An Introduction to Entomology. By Professor JOHN HENRY COMSTOCK. Part I. Ithaca, New York. Published by the Author. 1888.

THIS part, which introduces what bids fair to be one of the most important books upon the subject of Entomology, contains—Thysanura, Mallophaga, Orthoptera, Neuroptera and Hemiptera. There is much originality in the work, which is profusely illustrated; many being from drawings by Mrs. Comstock, others having done duty elsewhere, but they are none the less useful now. We shall be interested to see the whole work on completion.—J. T. C.



F.W. Frohawk del et lith.

West Newman & Co. incp.

New species of Crambids.

THE ENTOMOLOGIST.

VOL. XXII.]

MAY, 1889.

[No. 812.]

ON THE SYNONYMY OF *ACIDALIA HUMILIATA*, HUFN.

By JAS. W. TUTT, F.E.S.

I HAVE been much puzzled about the synonymy of one of our common Kent *Acidaliæ*, viz., the one that goes in different lists by the names of *osseata*, *dilutaria*, and *interjectaria*.

Wishing to form some sort of satisfactory conclusion as to which of these our species really was, I have worked up all the continental literature I can find on the subject, and have come to the conclusion that the name *ossearia*, Hb., had long been used in England; that owing to the absence in some of our specimens of a dark costal streak, and the position of the black central spot, this name was dropped and *dilutaria*, Hb., substituted; that Newman, for no very apparent reason,* dropped both these older names, and gave us Boisduval's comparatively new synonym—*interjectaria*.

The matter seems to resolve itself into the consideration of the two older names, *dilutaria* and *ossearia*. *Dilutaria* is figured by Hübner (fig. 100), *ossearia* also by Hübner (fig. 102), so that on the score of age both were produced together, although I suppose for our purpose fig. 100 must be considered older than fig. 102.

Turning to Hübner's fig. 100 (*dilutaria*), we find an insect about which, I must confess, I have considerable doubt. I have a long series before me, of some 60 or 70 of the species under question, and must own that among them I have not a specimen which I believe to be represented by Hübner's figure. My opinion is that *dilutaria* is a distinct continental species which we do not get. This opinion is borne out by the way that Dr. Standinger treats the two figures of Hübner in the last edition of his 'Catalogue.' He retains the species represented by fig. 100 as

* The reason probably was that Boisduval treated the specimens with a brownish costa as specifically distinct.

distinct from that represented by fig. 102, and treats them in his list as two distinct definite species, fig. 100 being his *dilutaria*, fig. 102, *ossearia*, being a synonym of Hufnägel's *humiliata*. If, therefore, the two figures of Hübner represent distinct species, and I feel satisfied they do, the question is, To which is our species to be referred? I think I am right in believing it to be *ossearia*. Hübner's figure is characteristic of *many* bred and fine English specimens, the dark shade perhaps a little overdone, but otherwise the rounded character of the wings is clearly developed, and also the characteristic fine wavy lines. I once reared this species (about 1875), on knotgrass I believe,—but I am speaking from memory, and have no notes,—some with fine dark costæ, but some without, and I have frequently captured such specimens at Strood, Deal, and many other localities. Only those in the finest condition are thus marked, and not always then, for bred specimens are frequently without any special development of this shade; but I believe every one who has had a long and close acquaintance with the species would support me in this view.

With regard to the position of the black central dot in the anterior wings of our species, I may say that I have specimens in which it varies from being *on* the second streak to midway *between* the second and third streaks, others being intermediate between the two extremes, so that this is really no definite character at all.

As there seems very little doubt that our species is not the continental *dilutaria* at all, nor the *dilutaria* of Hübner, but that it is the *ossearia* of Hübner, which Dr. Staudinger is perfectly convinced is only a synonym of Hufnägel's *humiliata* (Hufn. Berl. M. iv. 614, date 1769); all our English-used names should drop out, and *humiliata*, Hufn., be substituted in its place, thus bringing us into unison with continental nomenclature.

The species should stand in our lists as—

Acidalia, Tr.

humiliata, Hufn.

osseata, Schiff. (S. V. p. 33, n. Cat.), Tr. (vi. 2, 32), Gn. (i. 467),
Mill. (Ic. 64-7), Dup. viii., Hb. 102.

interjectaria, B. (gen. p. 224). *dilutaria*, Hb. 100?.

In the distribution of *humiliata*, Hufn. = *ossearia*, Hb., Staudinger gives Europe, *except* reg. bor., Sicily, Sardinia, Corsica, and Greece,—thus including England; while in the distribution of *dilutaria* he gives Central Europe, *except* Germany, S. Belgium, and England,—thus expressly excluding England.

If any entomologists should still consider that Hübner's figs. 100 and 102 (*dilutaria* and *ossearia*) really represent two forms of our species, both the names must sink as synonyms of Hufnägel's *humiliata*, for if one falls, the other—being of the same date—must sink with it.

It will be seen that I have altogether ignored Boisduval's and Guenée's name *interjectaria*, for after carefully studying their works I have come to the conclusion that Boisduval did not even make out a *primâ facie* reason for re-naming the insect. In his 'Index Lepidoptera Europæ' he gives the following synonymy for the two species:—

{ <i>osseata</i> , Hb., Dup. <i>ossearia</i> , W. V., F., D. }	No. 1877, p. 224. }	A.D. 1840.
{ <i>interjectaria</i> , Boisd. <i>dilutaria</i> , Hb. }	No. 1879, p. 224. }	

If he considered Hübner's *dilutaria* synonymous with his *interjectaria*, why did he re-name the species? And how can we possibly account for the fact that in his and Guenée's joint work, 'Naturelle des Insectes,' vol. ix., published seventeen years afterwards, they (or rather Guenée) make the distinction between *osseata* and his *interjectaria* to consist in the fact that while "*osseata* has a reddish shade along the costa, *interjectaria* has a brown one," when Hübner's *dilutaria* has no such shade? He (or Guenée) must have had *interjectaria* without a costal shade, otherwise the use of the synonym becomes inexplicable. I can recommend those interested in the matter to look up pp. 467, 468, of the above work. It will give them a good insight into what a French species is sometimes worth, and is an excellent characteristic of *un peu plus* and *un peu moins*, for which the descriptions of French entomologists have become celebrated. To explain what I mean, Boisduval and Guenée say of *osseata*:—"It is singular that neither the authors of the Vienna Catalogue nor English authors have mentioned as a salient character the red costa of this species. It is true that it is pale sometimes" (Guenée thus acknowledges that the character is inconstant), "but rarely so altogether; and for myself, I believe it necessary to drop all descriptions which omit this character, and to treat them as the next species, with which, at first sight, this species might easily be confounded." But of *interjectaria* they say:—"This is a species very close to *osseata*; one only distinguishes it at first by the costa, which is brown and not red, but besides this the colour is paler, more pallid and shining, the wings are more sinuous at the margins, &c." These are the salient points of their diagnoses of the two species, and, considering what we know of the species, I am certain there is not a point mentioned by them that is reliable. Our species sometimes has a decided reddish brown costa, sometimes brownish with scarcely a tinge of red. At other times it is quite free from any shade whatever, but there is every intermediate form, and these differences cannot constitute a specific difference. Again, there is a good deal of difference in the shape of the outer margin and apex of the

anterior wings, but this is common to many species in this and other genera.

One very pointed note is added by Boisduval to his description of *interjectaria* :—"Il a tout-a-fait raison lorsqu'il (M. Delaharpe), dit, qu'elle disparaît quand *osseata* commence." Our experience in England is quite against this, for we get the forms altogether. I have captured the species continuously from June 30th to August 12th, at Deal. I may add that Boisduval and Guenée, in their work mentioned, say of both these supposed species "larva unknown," so that the characters of the imagines were the only means of separation.

The first note as to *A. interjectaria* being a British insect is to be found from the pen of Mr. Doubleday (Entom. iii. 261), where he states that "having received specimens of *interjectaria* from Dr. Staudinger, he was convinced that specimens he had received from Cambridge belonged to this species, and that Guenée had identified them as such." This I quite agree with; there is not the remotest doubt that some of our specimens represent the *interjectaria* of Boisduval. We must remember, however, that our lepidopterists considered they were getting two species—*osseata* and *interjectaria*. The next note is from Mr. Howard Vaughan (Ent. Mo. Mag. iv. 91), where he announces the capture of the new species *interjectaria* at Plumstead, and telling us he did not distinguish them at the time from *osseata*, leaving us to assume that he did afterwards so distinguish them. The next note is from Dr. Knaggs (Ent. Mo. Mag. iv. 113), to the effect that *A. interjectaria* is tolerably abundant at Folkestone. He then points out differences between the Folkestone specimens, Cambridge *interjectaria*, and British *osseata*, and adds,—"No doubt the extremes of these two forms are distinct enough, but it is a confessedly difficult job to draw the line between them." Probably, considering that we have only one species in England, and have to split it up "to draw the line." This was followed by a note from Mr. Doubleday (Ent. Mo. Mag. iv. 161), who writes from Epping :—" *A. osseata* is rare here, and I only know of one spot where it occurs. Specimens taken a few years since, which were evidently very fresh, had the costa decidedly ferruginous, but this colour faded soon after they were dead. The ground colour of the wings was also yellower than in any specimens of *interjectaria*." These differences also referred, of course, to our one British species. This last extract was written in December, 1867, and was followed in February, 1868, by another note (Entom. iv. 30), where he writes :—"I have recently received from Dr. Staudinger several specimens of the true *Acidalia osseata*. I had not seen a continental specimen before. The typical examples have a bright red costa, and I have never seen any British specimens like them; but I possess

five or six which appear to be identical with a pale variety (of *osseata*), also sent to me by Dr. Staudinger. There is, however, no doubt that the majority of specimens in our cabinets under the name of *osseata* are really *interjectaria*." This I quite agree with; the majority are of that particular form. And here our greatest lepidopterist left it. I have in my own collection continental typical *osseata* with red costa, and pale varieties of the same species identical with ours. My specimen of the former is almost identical with a strongly-marked specimen I captured last year within a hundred yards of my own house. The Rev. H. Burney has a note (Entom. iv. 19), but I do not attach much importance to it, for the most strongly marked of our own specimens on the one hand, and the palest on the other, would make two tolerably distinct series; but this gentleman was the first to give us *dilutaria* as a synonym. I do not find, however, that he ever referred to the original figures or descriptions of Hübner, but based his note on the opinion of Dr. Staudinger as exemplified in the arrangement of the cabinet of Herr Kaltenbach. Neither Mr. Doubleday nor Dr. Knaggs appear to have referred to Hübner, but took for granted what Mons. Guenée or Dr. Staudinger considered correct. Yet this book is readily attainable. Dr. Staudinger, apparently soon after this, came to the conclusion that our species was specifically identical with *ossearia*, Hb. (teste his 'Catalog'). Hufnägel's work cannot be referred to by British lepidopterists, but so far as I have tested Dr. Staudinger's use of this author he has always been correct. In conclusion I would add that if anyone who has really long series from many different localities will compare their specimens with Hübner's figures, they will be satisfied that Hübner's *ossearia* is a strongly-marked form of our species, and that *interjectaria*, Bdv., has no *raison d'être*.

Westcombe Park, Blackheath, S.E.

ON THE VARIATION OF INSECTS.

By T. D. A. COCKERELL.

(Continued from p. 100.)

SUMMARY AND REMARKS ON COLOUR VARIETIES.

THE portions of this paper which have already appeared were written early in 1888, and hence some interesting facts more recently made known to me have yet no place in it. In any case, a subject of this kind cannot be in any sense finally treated,—at least not until our knowledge is incomparably greater than it is at the present day; and any writer who discusses variation must be prepared to consider every new fact or suggestion without

being unduly biased by previous conceptions. The phenomena of colour variation are essentially of three distinct kinds:—

1. Due to a change in the nature or arrest in the metabolism of a pigment (chemical).

2. Due to a change of structure (physical).

3. Due to a change in the proportion of the normal colours.

The third of these is generally easy to distinguish; the first and second are easily confused, especially when descriptions only are accessible of the varieties under consideration. It will be useful to review these three classes:—

1. We have seen that red may be replaced by yellow, and more rarely yellow by red. A white pigment may also be changed to yellow, and, again, yellow is sometimes replaced by white (as in *Rumia*, see Entom. xxi. 15; and in *Heliodes arbuti albescens*, which has white in place of yellow on the secondaries, see Newman, 'Brit. Moths'). A caustic alkali will change the white of *Lycæna* to yellow, and a damp cyanide bottle will dye the yellow of *Colias* and of some Hymenoptera a deep red: these are chemical changes, presumably due to a change in the nature of the pigment. But alkali will not turn a white *Pieris* yellow; and, in fact, according to Dr. Dimmock, there is very little pigment at all in the white of a *Pieris*,—it is a sort of optical illusion, comparable to the white of finely-ground glass. So here at once is introduced a difficulty, which seems to throw such variations as *Pieris rapæ novangliæ*, *P. napi flava* (upper side entirely canary-yellow, C. G. Barrett, E. M. M., 1888, 81), and *Bryophila perla flavescens* into the third class instead of the first, and prove them to be caused by an enormous preponderance of that yellow pigment which is generally more or less visible about the typical forms. *Abraxas grossulariata lutea* I had already recognised (p. 2) as being of this nature. In the face of this evidence that changes from yellow to white and white to yellow, though apparently identical in their nature, really represent two radically different phenomena, one feels afraid of theorising about the other variations. Dimorphism of pigment, or dichroism, most certainly does exist, and is even frequent; but it is perfectly plain that to decide which varieties really belong to this class requires something more than a superficial examination. It is by the action of chemical reagents that we must test them. Pale forms, if due to a non-metabolism of pigment, will come properly under the first division; but it is possible that the green of *Venilia macularia viridimaculata* is really a deceiving combination of black and yellow, like the green of *Anthocharis*. Will anyone who has an example of this variety please examine it with a microscope, and report? Some suffused varieties, which one would naturally class under the third division, must belong to the first, because a damp cyanide bottle gives a suffused appearance to *Danais*

plexippus, and a similar variety occurs in nature (see 'Entomologica Americana,' vol. i. p. 159). A noteworthy form of dichroism, which must surely belong to the first division, is a change from blue to red or crimson, and *vice-versâ*. This occurs in *Catocala* (e.g., *Catocala nupta cærulescens*, with blue secondaries, as recorded in the 'Entomologist,' p. 51), and more frequently in the Locustidæ, as *Melanoplus atlantis cæruleipes*, Ckll.; *M. packardii rufipes*, with hind tibiæ red instead of blue (see 'Canadian Entomologist,' 1885, p. 18); *Caloptenus spretus cæruleipes*, with hind tibiæ blue instead of red (Can. Ent., 1878, 105). A similar dichroism appears in the secondaries of a European locust. It is worthy of remark that (so far as I know) each genus that presents this kind of dichroism also has species in which yellow takes the place of red or blue, and others in which the typical red varies to yellow, though in these species the red does not also vary to blue, nor do blue species seem to revert to yellow. Probably the yellow represents least, and the blue most, specialisation, as is said to be the case with the colours of flowers.

2. This is Hagen's class 1 (Ent. Mo. Mag. 1872, 78—83). I think it is almost certain that silver markings (as in *Argynnis*) are due to a change from white, but neither white nor silver are pigment. Dr. Dimmock (in 'Psyche') compares the white to ground-, and the silver to smooth-glass; and the comparison seems a particularly happy one. Probably such varieties as *Colias edusa purpurascens* belong to this division.

3. This, in which the proportions of the different colours are changed, includes a vast multitude of forms; and variation of this kind, instead of being comparatively rare, like those under 1 and 2, occurs in almost every species. My subdivisions "m," "n," "o," "p," afford good illustration of this variation.

Additions and References.

Glancing over the various subdivisions ("a" to "p"), I now give a few addenda and references to literature, which will be useful to those interested in the matter:—

(a.) 1. I have taken a variety of *Danaïx plexippus*, illustrating a condition opposite to that of the variety of *P. huntera*, quoted. This is described by Mr. Jenner Weir (Entom. 52). 2. See Scudder, on red varieties of the locustid *Amblycorypha* ('Psyche,' 1888, 69). I have not seen these varieties, and dare not theorise; but it is worth noting that some Locustids when put into alcohol turn red. 3. The American species of *Callimorpha* are divided into those with white and those with yellow secondaries (see Lyman, Can. Entom., 1887, 181). Probably the European red-winged species are more highly specialised than the American, and these occasionally revert to yellow. In the same way, the American form (*americana*) of *Chelonia caia* is probably nearer the primitive

type than ours, especially the var. *utahensis*, Hy. Edw., which has pale orange secondaries. *C. parthenos* is another nearly-allied form, which I find in Western Custer Co., Colorado, at 8400 feet alt. (I have to thank Mr. H. Strecker for the identification of this). 4. *Zygæna lavandulæ lutescens* has been found at Cannes (see Entom. xxi. 211). For another example of red and yellow forms, see G. M. Dodge on *Edipoda corallipes* (Can. Ent., 1876, 101).

(e.) *Teras oxycoccana* is ash-grey, but the dimorphic form *malivorana* of Le Baron is orange. This dimorphism is without reference to food or sex. Similar phenomena occur in many British species, of which I have received full and interesting details through the kindness of Mr. J. W. Tutt. *Teras (Rhacodia) caudana* has two forms, which are neither sexual, seasonal, nor phytophagic. Mr. Tutt adds, "With regard to the other Tortrices it is a wide question; and when an extensive series is obtained I believe many dimorphic species become polymorphic, *i. e.*, I believe that the two extremes and generally better-known forms are connected by other intermediate forms. I hardly know whether polymorphic is at all a correct word to use in this case, as there are decidedly only two forms joined by intermediates." Of the British species of *Tortrix*, Mr. Tutt tells me that *xylosteana* and *ribeana* are polymorphic; *rosana*, *heparana*, *costana*, and *palleana* are dimorphic; *lafauriana*, *unifasciana*, *viburnana*, and *palleana* var. *icterana* are sexually dimorphic; *ministrana* has a melanic form of restricted occurrence; but the black form of *podana* is not restricted to any particular district, being taken in Notts, Yorks, Kent, Surrey, &c. In *Penthina*, says Mr. Tutt, "there is a strange case of dimorphism, certain forms losing their dark colours, and becoming white, with grey shades." Mr. Tutt has such a form of *P. variegana*. In the birds of the genus *Nyctidromus*, red and grey phases occur, the red being more prevalent in the tropics (see G. B. Sennett, 'The Auk,' 1888).

(f.) 1. Mr. W. H. Edwards, in Canad. Ent., 1876, 203, writes that *Lycæna comyntas* is "dimorphic in the female, most of this sex here (Coalburgh) being black, the others blue, with broad black margins. This phenomenon is similar to that of *pseudargiolus* in its winter form *violacea*." But the black *pseudargiolus* have since been found to be males, so perhaps the dimorphism of *comyntas* is also really in the male. I incline to consider that *Lycæna* presents an exception to the general rule, that in cases of sexual dimorphism in Lepidoptera it is the female that has varied from the original type; and this is why we find that almost unique phenomenon, a phase of dimorphism confined to the male. 2. To the cases of pale female *Coliades*, *C. christina* ♀ *pallida* (H. H. Lyman, Can. Ent., 1884, 6) and *C. alexandra* ♀ *pallida* (W. H. Edwards, Can. Ent., 1887, 229) may be added. The

frequency of these pale females varies exceedingly in the different species. In *C. scudderi* the yellow female seems to be an exception. In the seasonally dimorphic forms of *C. eurytheme* here, *pallida* is very common in the summer brood (*intermedia*), but I have never found it in the autumn and spring form (*autumnalis*). Nevertheless, a whitish form has been recorded for the var. *hagenii*, which is close to *autumnalis*. Mr. J. Anderson, jun., in his most interesting note (Entom. 72), shows that the *helice* female of *C. edusa* varies itself quite considerably, and he has even a buff-coloured variety of the female *edusa*, apparently intermediate between *helice* and the type.

(g.) 1. Aberrations, somewhat similar to that quoted in *Leucania conigera*, are recorded in *Chrysophanus phlæas* and *Papilio bianor* (see Ent. Mo. Mag., 1888, 278). 2. May I again entreat entomologists to look to the matter of asymmetry? C. H. T. Townsend, in Can. Ent., 1884, 238, says that the elytra of seven out of seventeen specimens of *Alaus oculatus* were unequal in length; of these seven, five had the left elytron shortest, these also being the cases in which the inequality was most prominent.

(h.) Additional cases of pseudohermaphroditism have been recorded in *Bupalus* and *Erebia* ('Psyche,' 1888, 92), in *Lycæna corydon* (Entom. xxi. 13), and in *Saturnia pavonia*; the last from Lincoln, recorded in 'Naturalist,' 1888, 199. The last sentence of section "h," "tokens that the female was once dimorphic," should read "female or male," as I think it was the male *Lycæna* that varied, and probably also the male *Anthocharis*, though we hear (Entom. 72) of a female *A. cardamines* with some of the orange of the male asymmetrically developed. This, however, is probably not an atavism, but a tendency on the part of one sex to adopt new peculiarities which have long been held by the other. It quite confirms the view that it is the male *Lycæna* that has varied, that Mr. W. H. Edwards records (Can. Ent., 1888, 160) an "hermaphrodite" of *Lycæna neglecta*, which on dissection proved to be a male. This observation is very important, and it is exceedingly desirable that it should be repeated with other pseudohermaphrodites.

(i.) Although one Chalcid presents a *pseudomas* form, another, *Pteromalus quadrimaculatæ*, has a var. of the male approaching the female in appearance, as recorded by Mr. Ashmead.

(k.) 1. On the small size of vernal broods (see C. V. Riley, 4th Report, U. S. Ent. Comm., 1885, 352). 2. On dark vernal forms of *Ips fasciatus* (see Dr. John Hamilton, Can. Ent., 1885, pp. 46, 47). 3. Compare the remarks (p. 29) on *Gonepteryx* with Darwin on *Fringilla cannabina* in England and Madeira ('Descent of Man,' p. 394).

(l.) 1. The dark *Colias*, mentioned on p. 55, is *C. meadii*,

Edw. Mr. W. H. Edwards has recently described the larva from specimens obtained from eggs laid by a female captured by Mr. W. S. Foster on Marshall Pass, Colorado. The larvæ are darker than those of any other *Colias* known to Mr. Edwards. 2. Recent observations and records have tended to confirm the view that melanism, or at least one form of it, is due to dampness. Conversely, pallid forms occur predominantly in the arid districts of Western North America, and I believe also in similar districts in Asia. With regard to the small mammal *Spermophilus tri-decemlineatus pallidus*, it "is the subspecies characteristic of the plains, and its pallid colour, like that of numerous mammals and birds of the same region (of Western N. America), is due to the aridness of the area which they inhabit" (Dr. C. H. Merriam, in litt. to H. G. Smith, jun.).

For the present paper, this shall suffice for colour-variation. It now remains to treat of varieties of shape and size, and of certain other matters, such as hybridism.

ERRATA.—P. 4, line 9 from bottom, for "*typica*" read "*chrysographia*, Hb." P. 6, line 25 from bottom, for "formally" read "formerly." P. 55, line 11 from top, for "*obscura*" read "*salicis*, Staint." P. 55, line 13 from top, for "*nigrescens*" read "*infuscata*, White."

(To be continued.)

LIST OF THE BRITISH STRATIOMYIDÆ, WITH ANALYTICAL TABLES AND NOTES.

By E. BRUNETTI.

(Concluded from p. 86.)

6. ODONTOMYIA, Mg. (1804), Klass. i. 128. = STRATIOMYS, p. Zett.

- | | |
|---|--------------------|
| A. First antennal joint twice as long as 2nd. | |
| B. Abdomen with whitish pubescence | <i>argentata</i> . |
| BB. Pubescence absent. | <i>microleon</i> . |
| AA. First antennal joint as long as 2nd. | |
| C. Abdomen all black | <i>tigrina</i> . |
| CC. Abdomen yellow or green, marked with black | |
| D. With 3 pairs of distinct spots | <i>ornata</i> . |
| DD. Yellow or green, with black dorsal stripe; no distinct spots. | |
| E. First vein from the discoidal cell rudimentary, 3rd complete | <i>viridula</i> . |
| EE. First vein complete, 3rd rudimentary. | |
| F. Black abdominal band narrower on 1st segment than the others. | <i>hydropota</i> . |
| FF. Black abdominal band of equal width on all segments. | <i>angulata</i> . |

1. *O. microleon*, L. (1761), F. Suec. ii. 1781. — Four distinct species have come under my notice as "*microleon*." One in the Entomological Club collection was *O. ornata* var.; one in

the Banksian collection was far too small to be this species, and was too dilapidated to identify; one in Dr. Mason's collection which, though I fail to recognise it, is certainly not this species; and one in Dr. Meade's cabinet, this latter being the only specimen I can safely refer to this species. I found one in the British Museum general collection under the genus *Oxycera*. Very rare. I have one from Austria.

2. *O. argentata*, F. (1794), Ent. Sys. iv. 266. = *paludosa*, Schum.—The under side of the abdomen of this species is said to be green, but I have not noticed this fact, it may, however be the case in living specimens; I know the green colour of *O. viridula* often fades after death. Not uncommon. On willows. Generally distributed.

3. *O. ornata*, Mg. (1804), Klass. i. 129. = *furcata*, Latr.; *transformations*, Reaumur Mem. iv. pl. xxv.—The British Museum collection contains an interesting variety, in which the markings on the face differ from those in the type. Prof. Jænnicke has bred this species from aquatic larva. Rather common, and generally distributed.

4. *O. tigrina*, F. (1781), Sp. Ins. i. 417. = *nigrita*, Fall.—Not common. Easily recognised by its entirely black colour.

5. *O. angulata*, Panz. (1798), F. Germ. lviii. 19. = *ruficornis*, Zett.; *brevicornis*, Lw.—Mr. Verrall introduced it to our fauna in the Ent. Month. Mag. for Jan., 1886, having taken one female at Tuddenham in July. Mr. Dale has it also in his collection from the south-west. Allied to *hydropota*, Mg. Very rare.

6. *O. hydropota*, Mg. (1822), Sys. Bes. iii. 147.—This species I considered "uncertain" for a long time, but among some specimens from his collection very kindly lent me by Mr. C. Dale for examination, I found a specimen undoubtedly of this species. I have it from France and Bohemia, it being rather common on the Continent. Very possibly it is now quite extinct in Britain.

7. *O. viridula*, F. (1775), Sys. Ent. 760. = *canina*, Pz.; *jejuna*, Schr.; *dentata*, *subvittata*, *bimaculata*, Mg.; *interrupta*, Lw.—The variety *subvittata*, Mg., is so pronounced that, but for Schiner and Jænnicke ranking it as such, I should have regarded it as specifically distinct. It is entirely yellowish, with an irregular narrow black central stripe on the abdomen. Dr. Mason's collection contains some extraordinary varieties of this common and widely distributed species.

Walker introduced *O. connexa* as British, giving no locality, but mentioning its rarity and presence in the British Museum. In the corrections in vol. iii. of his Ins. Brit., he admits that it is not even European, and that it was inserted by mistake. What I believe to be his type specimen is still in the British Museum British collection. He also introduces *O. hydrodromia*, Mg., and *O. hydroleon*, Mg.; but of neither of these species can I find

any specimen. *O. hydroleon* having pubescent eyes, would fall in Rondani's genus *Psellidotus*.

7. SARGUS, F. (1798), Ent. Sys. Supp. 566.
= NEMOTELUS, DeG.; MUSCA, L.

Walker and Curtis both describe this genus as being destitute of palpi, but these organs (though small) are present.

Brown suffusion around stigma - - - - *cuprarius*.

No suffusion.

Wings almost clear. - - - - *flavipes*.

Wings uniformly pale brown - - - - *infuscatus*.

1. *S. cuprarius*, L. (1761), F. Suec. 1853. = *violaceus*, Scop.; *cæruleicollis*, Mg.; *nubeculosus*, Zett.; larva, De G. Ins. vi. pl. xii.—Zetterstedt's *nubeculosus* was ranked by Walker and Schiner as distinct, the former suggesting that it was a variety of this species. Zetterstedt made its inferior size the principal distinction, but I have seen specimens showing every grade in size. Van der Wulp, the latest authority on this family, also ranks it as a var. of *cuprarius*. Common everywhere; London included.

2. *S. infuscatus*, Mg. (1822), Sys. Bes. iii. 107. = *cuprarius*, Linne's Coll.; *indicus*, Harr.; *auratus*, Mg.; *iridatus*, Walk.—Common, and widely distributed. Easily recognised by the uniformly brown wings. Taken occasionally in and about London.

3. *S. flavipes*, Mg. (1822), Sys. Bes. iii. 108, pl. xxv. 14.—Zetterstedt mentions that the femora in the male are black. It is important to know this, as it affords an easy method of distinguishing it from the male of *C. bipunctatus*, in which species the legs are entirely tawny-yellow in both sexes. Rather uncommon, though Walker describes it with his customary and monotonous, "generally distributed." *S. nitidus*, Mg., was introduced as British by Curtis, but I can find no specimens belonging to this species.

8. CHRYSNOTUS, Lw. (1855), Verh. Zoo. Bot. Ges. v. 131.
= SARGUS, Walk., Curt.; MUSCA, Scop.

1. *C. bipunctatus*, Scop. (1763), Ent. Carn. 341. = *Reaumur*, F.; *transformations*, Reaumur, Mem. iv., Pl. xiii., xiv., xxii.—Uncommon, almost rare. It has occurred in Yorkshire, Kent, and other well-separated localities. Curtis' figure of the antenna is incorrect.

9. CHLOROMYIA, Dunc. (1837), Mag. Zoo. Bot. (1837).
= MUSCA, L.; NEMOTELUS, De G.; SARGUS, F.; CHRYSOMYIA, Walk., Schin.; CHLORISOMA, CHLOROSIA, Rond.

Prof. Van der Wulp, in his 'Diptera Neerlandica,' retains the old generic name, *Chrysomyia*, for this species, and includes in the same genus both species of *Microchrysa*. I am rather doubtful of the right of *Chrysonotus* to generic rank, but *Chloromyia* and *Microchrysa* seem quite distinct.

1. *C. formosa*, Scop. (1763), Ent. Carn. 339-910. = *auratus*, F.; *flavogeniculatus*, De G.; *cuprarius*, Scop.; *cicur*, Harr.; *xanthoptera*, Mg.; *azureus*, Lw.—Very common everywhere; London included. The list of synonyms will show how variable the species is, though when once well recognised it cannot be mistaken for any other species in the whole order.

10. MICROCHRYSA, Lw. (1855), Verh. Zoo. Bot. Ges. v. 131.
= CHRYSOMYIA, Walk.; SARGUS, F.; NEMOTELUS, De G.; MUSCA, L.

Antennæ black. - - - *polita*.
Antennæ tawny. - - - *flavicornis*.

1. *M. polita*, Linn. (1761), F. Suec. (1854). = *aurata*, De G.; *cyaneus*, F.; *splendens*, Mg.; *vitreus*, Harr.—In one variety of this common and widely-distributed species, all the tibiæ are tawny-yellow in both sexes.

2. *M. flavicornis*, Mg. (1822), Sys. Bes. iii. 112. = *parvulus*, Harr.; *pallipes*, *cyaneiventris*, Zett.; *politus*, Fall.—Dr. Meade's collection contains one specimen of the very distinct variety *cyaneiventris*, taken near Bradford. The type and the var. *pallipes* are common everywhere, both this and the last species occurring also in London.

11. BERIS, Latr. (1802), Hist. Nat. d'Ins. xiv. 340.
= STRATIOMYS, F.; MUSCA, L.; ACTINA, Mg.

- A. Abdomen all tawny yellow.
B. Transverse abdominal furrows near apex of each segment. *clavipes*.
BB. Furrows hardly visible, or absent. - - - *vallata*.
AA. Abdomen violet or bluish black.
C. Wings all brown; legs chiefly black or brown.
D. Legs light brown; hind metatarsus very thick, not longer than the rest of the tarsus. - - - *chalybeata*, ♂.
DD. Legs dark brown, knees lighter; hind metatarsus not thickened, longer than the rest of the tarsus. - - - *fuscipes*, ♂.
CC. Wings yellowish grey, a large brownish black stigma; legs chiefly yellow.
E. Eyes on vertex separated by one-third of the width of the head.
F. Hind metatarsus much longer than the four other tarsal joints together. Brown band towards tip of posterior femora. *fuscipes*, ♀.
FF. Hind metatarsus as long or hardly longer than the four other tarsal joints taken together. Posterior femora unmarked. *chalybeata*, ♀.
EE. Eyes on vertex contiguous or parted by only one-fifth of the width of the head. - - - *morrisii*, ♂, ♀.

There are only five European species of *Beris*, all of which inhabit Great Britain.

1. *B. clavipes*, Linn. (1767), Sys. Nat. ii. 981. = *nigra*, Geoff.
—Common. The female has dark wings.

2. *B. vallata*, Forst. (1771), Nov. sp. Ins. Cent. i. 96. = *nigritarsis*, Lat.; *clavipes*, Mg.—It is almost impossible to distinguish the males of this species from those of *clavipes*. The transverse

furrows on the abdomen are usually more distinct in *clavipes*. The female has light wings. Common.

3. *B. chalybeata*, Forst. (1771), l. c. 95. = *sexdentata*, Mg.; *flavipes*, Mcq.; *obscura*, Zett.; *atra*, Mg.—This species has been bred from pupæ found in moss. Variable, common.

4. *B. fuscipes*, Mg. (1820), Sys. Bes. ii. 8. = *geniculata*, Curt.—Uncommon; but not "rare," as Walker states. South coast. The *geniculata* var. of Curtis comes from Ireland.

5. *B. morrisii*, Dale (1842), Entom. (1842), p. 115. = *pallipes*, Iv.—Uncommon. South Coast.

12. ACTINA, Mg.

= CHLORISOPS, Rond.

1. *A. tibialis*, Mg. (1820), Sys. Bes. ii. 3.—Variable, rather common. Found in woods. The other European species, *A. nitens*, has been recorded as British, but does not appear to have any claim to a place in our lists.

Being at present engaged on a revision of the British *Asilidæ* and *Conopidæ*, I should esteem it a favour if anyone having collections of these groups would kindly allow me to examine them.

My best thanks are due to Mr. Verrall, Dr. Meade, Dr. Mason, and Mr. Dale, for allowing me examination, in whole or in part, of their collections, and for most useful information; also to Mr. B. Lowne, for affording me an opportunity of inspecting the Entomological Club Collection.

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CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.

By J. W. TUTT, F.E.S.

(Continued from p. 98.)

Neuria, Gn., *reticulata*, Vill.

The type of this species is described in De Villers' 'Caroli Linnæi Entomologia Fauna Suecicæ,' &c., ii. p. 254, as follows:— "Phalæna Noctua (le réticulée) spirilinguis, thorace cristato-angularie, alis deflexis fuscis, rivulis reticulatis griseis. Alæ superiores brunneæ, lineis strigisque griseis quasi reticulatæ; in medio prope marginem exteriorem, macula grisea ovaliformi duplicique circulo. Alæ inferiores infra et supra griseæ."

This is one of our most constant species in Britain. In the series I have, the only noticeable point of variation is in the shape and direction of the stigmata (orbicular and reniform); but it

does not appear to be so invariable, in the ground colour at least, on the Continent. Hübner, under the name of *typica*, figures a rich purple-brown variety; while Guenée says of the French specimens, "The two median lines geminated, tinted with rose-colour" ('Noctuelles,' vol. v. p. 167). Probably these brightly-coloured forms exist in collections in Britain. Mr. N. F. Dobrée writes:—" *N. reticulata* is so scarce in this part of the E. Riding (Beverley) that I have never taken more than two; but these still retain a decided vinous tinge, though taken five years ago" (in *litt.*). Our ordinary British form was described by Haworth, under the name of *marginosa* ('Lepidoptera Britannica,' p. 195, No. 101).

α. var. typica, Hb.—Hübner figures (58) the type of this variety, of which I made the following description:—"Anterior wings of a rich purplish brown, with the longitudinal nervures nearly absent, otherwise much like our own specimens; the three pale transverse lines and stigmata outlined in pinkish grey. Hind wings grey, hind margin darker, with three white dots in centre of extreme outer margin; a distinct transverse line and lunule."

β. var. unicolor, Stdgr.—This variety is mentioned by Staudinger in his trade list, and in answer to a query Mr. Dobrée has written:—"The var. *unicolor* derives its name from being a uniform brown-grey, the nervures and markings being pricked out in a lighter shade of the ground colour. My specimens are from Kaschgar, in Russian Turkestan" (in *litt.*).

Neuronia, Hb., *popularis*, Fab.

This species was described more than once by Fabricius. His description, taken from the 'Entomologia systematica emendata et aucta,' &c., p. 484, No. 240, is as follows:—"Bombyx* alis incumbentibus fuscis albo venosis posticis albidis. Statura præcedentis (*graminis*). Antennæ pectinatæ, fuscæ. Alæ anticæ fuscæ venis albis. In medio maculæ ordinariæ pupilla obscuriore. Versus apicem striga e maculis parvis, sagittatis, atris. Posticæ albidæ margine obscuriore subtusque puncto centrali, fusco." Haworth, in the 'Lepidoptera Britannica,' p. 117, describes the species under the name of *popularius*; whilst Hübner figures a form tinged with pink under the name of *graminis*.

The variation of this species appears to be confined within very narrow limits. In some specimens the orbicular is large, and formed of a dark centre surrounded by white or ochreous, in others it is a pale spot, while in others it is almost obsolete; the reniform also varies in colour and size. The transverse lines are sometimes white, sometimes ochreous, sometimes tinged with pink, as in Hübner's *graminis*. There is also a considerable

* It must be borne in mind that the early lepidopterists classed all our *Noctus* with pectinated antennæ as Bombyces.

amount of difference in the intensity of the dark grey border the hind wings of the males. In some it may be described black, so intense is it; while in other specimens there is a grade of intensity to an almost total absence. In both cases there is a great deal of difference in the development of the wedge-shaped marks parallel to the hind margin, but they vary most in this respect. There is a good deal of difference, the males being, as a rule, much smaller than females. Mr. Dobrée writes:—"In a male I have from Cerny, Russia, the ground colour is slate-grey" (*in litt.*).

Var. *graminis*, Hb.—Hübner's fig. 59 has "all the pale longitudinal and transverse markings with a distinct pinkish tinge, hind wings pinkish." The markings are as in our British specimens, the difference being that of colour, although our British specimens often have the nervures tinged with pink.

Heliophobus, Bdv., *hispida*, Hb.-Gey.

Geyer's figures 784-86, in his Supplement to Hübner's 'Schmetterlinge,' &c., represent the type of this species. Figure 784 may be described as, "Anterior wings purplish brown with all the pale markings of a delicate violet, except along the inner margin, where they are yellow. Antennæ pectinated. Hind wings grey, darker on the hind margin, with a dark line parallel to the hind margin." His figure 785 is the under side of a male represented in fig. 784; while fig. 786 is a female, having "the anterior wings dark reddish brown, with all the transverse lines ochreous, and nervures white." I believe the *editio* of Hübner (fig. 694) is only a small *hispida* ♀. It would appear that the continental specimens of this species are generally more violet than our British specimens, for in 'Noctuelles,' vol. v. p. 172, Guenée, describing his var. A, says "less violet," thus leaving us to assume that their type, which he refers to Hübner's fig. 784, is violet-coloured. For this type he gives as a locality, "Provence." Regarding these violet-tinted *hispida* in England, in answer to a query from me, Mr. Nelson Richardson, M.A., writing from Weymouth, says:—"I cannot find anything worth calling a violet tinge on any of my specimens; there is an approach to a violet tinge on the transverse line beyond the reniform, but I should not mention it in a description, as such, as it is scarcely violet, but rather steel-grey." I have received specimens from Mr. Richardson and Major Partridge, captured at Portland last year (1888), and I have a number of specimens from Torquay, but none of these show the typical violet coloration. It is remarkable that the specimens from Portland have a much clearer white ground colour* than those

* This is worthy of notice, as the same difference exists in specimens of *E. lichenea* from these localities.

from Torquay,—the hind margin of the anterior wings with a broad silvery band; while those from the latter place have only a fine line, and the hind wings of the former are so white that they present a very different appearance to Torquay specimens. The latter, indeed, appear to be Hübner's *oditis*. Among our ordinary British specimens we appear to have four (at least) distinct forms:—

1. A dark brown form, with deep ochreous stigmata, and dark ochreous grey hind wings in both sexes, = var. *suffusa*.

2. A dark brown form, with silvery white markings, white band on hind margin, hind wings comparatively pale, = var. *argentea*.

3. A pale brownish grey form, with white markings and white hind wings, = var. *pallida*.

4. An obsolete form, with no markings whatever between the reniform and outer margin, = var. *obsoleta*.

α. var. intermedia, mihi.—An intermediate form, described by Guenée as var. A, which serves to connect Hübner's violet type with our British specimens which are without such a tint. It is described in his 'Noctuelles,' vol. v. p. 172, as "Generally paler, more yellow, less violet, with the lines and stigmata more decided of a clearer white. The inferior wings clearer. Locality, West of France." If Guenée did not leave us to suppose that this variety was violet-tinged, I should certainly suppose it was the same as the ordinary Portland specimens.

β. var. suffusa, mihi.—Ground colour dark brown, with the stigmata of deep ochreous colour, the transverse lines and nervures of a whitish ochreous in the males, yellow ochreous in the females, a fine line bordering the hind margin; fringes grey. Hind wings grey in both sexes, with a very dark outer margin, and a dark transverse line; fringes grey. This is by far the most suffused form I have seen. My specimens came from Torquay.

γ. var. argentea, mihi.—Ground colour dark brown, with longitudinal nervures and basal transverse lines white; orbicular and reniform white, with a faint yellow tinge; a transverse grey (almost steel-grey) band beyond the reniform, and a broad white line parallel to the hind margin. Hind wings white, with a broken grey hind marginal band, and a grey transverse line; fringes white. The ground colour of the females is darker. My specimens came from Portland.

δ. var. pallida, mihi.—Ground colour grey, very pale, with a slight brownish tinge; costa very pale, whitish ochreous; a broad white line at hind margin; fringes white. Hind wings white, with scarcely a trace of the grey marginal border, and only the basal part of the grey transverse line; fringes white. This is an extreme form of var. *argentea*. Of this variety, Mr. Nelson Richardson writes, "This is a more common var., and very pretty, . . . I think the pale *hispidus* is the prettiest form of the species" (*in litt.*). My specimens came from Portland.

ε. var. obsoleta, mihi.—A very peculiar form of the insect. Ground colour dull grey, with very few pale markings; a pale abbreviated transverse basal line, a complete one just before the orbicular, a bifurcate transverse median line, extending under orbicular to the reniform and the central part of the basal nervures, are the only pale markings, besides the

orbicular, reniform, and a line parallel to hind margin. There is scarcely a trace of the ordinary pale markings between the reniform area and hind margin. Hind wings as in var. *argentea*. This appears to be a rare variety, for Mr. Richardson writes, "This does not seem to be a common var., as I have only seen one or two others with so little in the way of light markings" (*in litt.*). I have only Portland specimens.

♂. var. *oditis*, Hb.?—I am not certain that Hübner's figs. 694 and 695, *oditis*, really represent a variety of *hispidus*, but I firmly believe it is the same as my var. *suffusa*. If Hübner's *oditis* really is this species, the name would take priority of Geyer's *hispidus*. My description of *oditis* is as follows:—"♀. Looks like a small *hispidus*. Anterior wings brown, all nervures transverse lines and stigmata yellow-ochreous. Hind wings grey, darker on margin, a dark line parallel to hind margin, and dark lunule." Fig. 695 is the under side of fig. 694. Guenée, referring to *oditis*, says ('Noctuelles,' vol. v. p. 172), "I have not seen it, and know no one who possesses it."

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

GENERAL INDEX TO THE 'ENTOMOLOGIST.'—The proposal that Mr. Newman should publish, by subscription, a General Index to all the volumes of the 'Entomologist' issued (*vide* Entom. 78), has, we are pleased to say, been favourably received, and a large number who wish to take copies have already sent in their names. There still, however, remains a deficit, and it is most desirable that all those who intend to subscribe, but who have not, should do so as early as possible, so that the work may be proceeded with. We would remind our readers that this work will really constitute a *resumé* of Entomology for the past quarter century, and will form a large-sized volume, uniform with the series of the 'Entomologist.'—ED.

PIERIS BRASSICÆ WITH VEINS OF WINGS GREEN.—Chance has satisfied me that more importance has been given to this than the subject deserves. In Dr. Gill's cabinet there was a male specimen of this butterfly, with all the veins broadly green from the margins to the centre of the wings; and in Mr. Gregson's another, also a male, in which the same appears, but not quite so strikingly. In each of these insects blotches of colour at the end of some of the veins show that there has been a rupture, and that the cause came from the margins, not from moisture from the body of the butterfly. Last year I netted several *brassicæ* for practice in setting by my children. Individuals of these, pinned in a damp box, were neglected for some little time. When taken out, behold similar specimens to the above examples! the veins green, and ruptured identically the same as these so-called varieties. An experiment, made in consequence, proved that these could, at pleasure, be produced, provided the insect to be acted upon had been but a short time from the pupa.—SYDNEY WEBB; Maidstone House, Dover, April 3, 1889.

FOOD-PLANT OF HESPERIA ACTÆON.—In the E. M. M., vol x., p. 86, the late Mr. Wm. Buckler described the food-plant of the larva of *Hesperia actæon* as *Brachypodium sylvaticum*, and as I find this statement is not corrected in 'Buckler's Larvæ,' published by the Ray Society, it may be

well to publish Mr. W. Buckler's own correction of this error. The following is an extract from a letter received by myself from Mr. Buckler, dated, Emsworth, June 7th, 1880:—"I am indeed greatly rejoiced to see the larvæ of *H. actæon* in all stages of growth that you have so kindly sent me, and particularly at the blossom of the grass they feed on, for I can now be sure it is that of *Brachypodium pinnatum*, and not *sylvaticum*." I may add that *B. sylvaticum*, so far as I am aware, does not grow in the localities frequented by *H. actæon*, while *B. pinnatum* is abundant.—(Rev.) C. R. DIBBY; Studland Rectory, Wareham, April 1st, 1889.

AGLIA TAU.—The preconception I entertained with respect to *Aglia tau* was that it haunted the shade of forest glades and clearings, where the caterpillar bred reclusive on the tall and lofty trees; Mr. Kirby specifies the beech, lime, and oak. I encountered it, however, under different circumstances on a shrubby slope above the village of Olewig, near Treves, where I mistook it for a large unknown *Argynnis* butterfly; and later on I found the eggs laid on a low bush, resembling in aspect our English sloe, but with pointed leaves and otherwise different; a common shrub on the bleaker exposures of the heights that command the valley of the Moselle.—A. H. SWINTON; Tudor Villas, Bedford.

FOOD OF NYSSIA ZONARIA.—Noticing Mr. Milton's remarks (Entom. 113) that he had fed the larvæ of *Nyssia zonaria* on yarrow, I may mention that I have on two or three occasions (some few years since) reared the larvæ on yarrow. I think Mr. Arkle must have overlooked Stainton, Newman, and Merrin's Calendar, or he would have seen they all give yarrow as the food-plant.—JNO. HARRISON; 7, Gawber Road, Barnsley, April 8, 1889.

FOOD OF EPUNDA LICHENEA.—On the 8th instant I found a dozen larvæ of *Epunda lichenea* feeding on *Linaria cymbalaria* in a greenhouse, where the ivy-leaved snap-dragon was permitted to grow and trail on the shelves. My attention was first drawn to it by seeing so many of the long slender leaf-stems standing erect, minus the leaves, which had been consumed by the larvæ. I think this is worth noting, as it is a plant not hitherto recorded as its food-plant.—G. C. BIGNELL; 7, Clarence Place, Stonehouse, Devon, April 11, 1889.

OXYPTILUS TEUCRII.—In his remarks on the Pterophori, Mr. South still seems to overlook that the only way in which we could at present accept Haworth's name, *heterodactylus*, for this species, is by deliberately ignoring the law of priority, and accepting Haworth as the originator of the name, passing over De Villers altogether. At present we have no evidence at all of the identity of Haworth's *heterodactylus* with De Villers' *heterodactylus*, or that Haworth ever saw a single specimen, or even drawing, of the latter. Neither do we know at all what species De Villers' *heterodactylus* was. His description, "*Alis patentibus fassis, nigris, maculis albis*," is so vague, that it might equally well apply to several of the genus. The fact that Mr. Stephens, in his second and larger work in 1834, omitted the reference to Haworth, which he had inserted in his previous work in 1829, would rather lead us to suppose that he was in some doubt as to the synonymy. Mr. South's argument, elsewhere, that we should adopt the name from Haworth's specimen, because it *may* be identical with De Villers' species, is wholly unscientific. The burden of proof clearly lies on those

who wish to change a name like *teucriti*, which every British entomologist knows and understands, for a name which, to say the least of it, is utterly forgotten, is very questionable; and if adopted on the grounds brought forward may at any time have to be changed again if a named specimen of any other entomologist, British or continental, subsequent to De Villers, turned up, for there is no reason why Haworth's opinion alone should be accepted as final.—C. A. BRIGGS; 55, Lincoln's Inn Fields, April 15, 1889.

BUTALIS LAMINELLA IN KENT.—On looking through my series of *Butalis fuscocuprella* recently, I found four specimens of *B. laminella* among specimens captured at Cuxton in Kent. It will be remembered that this species was recently added to the British fauna by Mr. W. H. B. Fletcher.—J. W. TUTT.

SIREX IN NORTH WALES.—A year or two ago I caught a fine female specimen of *Sirex gigas* flying round a juniper in the garden. They are not uncommon round here, and several trees have been injured by the larvæ.—HILDA G. NAYLOR; Brynlllywarch Hall, Kerry, Montgomeryshire.

DESTRUCTION BY ANOBIUM PANICEUM, L.—During March last I discovered in my warehouse quite a colony of beetles, which had taken up their quarters in a box containing packets of Dr. Jenner's Food for Infants. The packets were completely riddled through and through, and the sides of the wooden box were grooved out, as if done with a very small chisel and auger, where the larvæ of the beetles had made their galleries. Both larvæ and beetles could be seen in hundreds; in fact all stages of the insect were present. Not being acquainted with its name, I sent a few by post to Mr. G. A. Lewcock, who kindly replied as follows:—"The beetles you sent are named *Anobium paniceum*, generally a very destructive species in its habits, particularly when allowed to remain undisturbed for some time in one habitat, as it breeds rapidly, and does not confine itself to any one class of goods. Very few articles of produce seem to come amiss as food, for I have seen drawers of whole ginger literally crowded with the beetles; and I have no doubt that Dr. Jenner's Food is admirably suited to the requirements of the larvæ, as instanced by your fine specimens."—J. A. CLARK; 48, The Broadway, London Fields, N.E.

THE COLD SUMMER OF 1888, AND DOUBLE-BROODED MOTHS.—It seems probable that the cold summer of last year will have left its mark on many of the insects which will emerge this year, and especially on the double-brooded moths, such as species of the genus *Selenia*; and it would be interesting to know whether the experience of collectors in any way bears this out. To my knowledge, species that would in ordinary seasons have been all double-brooded, had but a single brood in some cases last year; and when there was a double brood the larvæ of the second one suffered greatly in cases which fell under my observation, in numbers, vigour, and size, from the adverse influences to which they were exposed. Those *Selenia* I have bred—all of which proceed from the second brood—have been comparatively few in number, small in size, and with a large proportion of deformities. I am inclined to think that few of the second brood will have survived, and that what moths are taken this year will mostly be the immediate offspring of parents which laid their eggs last spring. They ought, therefore,—unless from other causes, which may be

at work,—not to be very abundant. I think there is no reason to expect those which have taken a whole year over their transformation to be very different in appearance from the ordinary spring examples.—F. MERRIFIELD; 24, Vernon Terrace, Brighton.

EXTRACTION OF MOTHS FROM PUPA.—With further reference to notes on this subject (Entom. xxi. 236, and xxii. 50, 76), permit me to say that I came in February, 1888, from South Carolina, U.S.A., and brought with me a large number of pupæ, among which were some *Papilios*, *Sphinges*, and *Bombyces*. These I placed in a cool greenhouse, and carefully looked after them; but several, apparently being ready to emerge, shrivelled and died. I finally decided to break the cases of those which laboured to emerge, and succeeded on several occasions; the wings expanded quite naturally, although some, I must add, failed to do so. I believe that if the attempt to assist the insect be made at the opportune moment it will most likely prove successful; but I think that the reverse will occur if the operation be either too early or too late.—J. P. GREGOE; Tredinick, Bodmin, February 15, 1889.

INSECTS AT HIGH ALTITUDES.—I am just now accumulating material for an account of the insect-fauna above 10,000 feet altitude on the E. slope of the Sangre de Cristo range; and, while doing so, I find I have notes of nine species taken above 10,000 feet in other parts of Colorado, which I may as well put on record, as insects from these high altitudes are always interesting to compare with those of the Palearctic regions. *Pachyta liturata*, Kirby, Leadville (10,200 feet), August 18th, 1887; *Buprestis maculiventris*, Say, and *Melanophila longipes*, Say, Pottery Pass (between Wheeler and Red Cliff), 1887; *Sirex flavicornis*, Fab., Leadville, August 18th, 1887; *Parnassius smintheus*, Dbl. & Hew., near Gibb's Peak, Sagnache Co. (over 11,000 feet), 1887; *Satyrus charon*, Edw., and *Lycæna rustica*, Edw., Fremont Pass, Lake Co. (over 11,000 feet), 1887; *Agrotis rubefactalis*, Grote, Fremont Pass, Lake Co.; *Camnula atroz*, Scudd., Leadville and Fremont Pass. For the identification of these (except the *Parnassius*) I am indebted to Mr. Hy. Edwards, Dr. John Hamilton, and the U. S. National Museum.—T. D. A. COCKERELL; West Cliff, Custer Co., Colorado, U.S.A., February 25, 1889.

REARING LARVÆ IN GLASS-CYLINDERS.—Can any of your correspondents refer me either to the 'Entomologist' or elsewhere for information as to rearing larvæ in glass-cylinders?—A. N. CHAMBERLAIN; Highbury, Moor Green, Birmingham, April 22, 1889.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—April 3rd, 1889.—Mr. F. Du Cane-Godman, M.A., F.R.S., Vice-President, in the chair. Mr. A. Cant, of 93, Robert Street, Regent's Park, N.W.; Mr. C. Cave, of 13, Lowndes Square, S.W.; Mr. N. F. Dobrée, of The New Walk, Beverley; Mr. J. Harrison, of Gawber Road, Barnsley; Mr. S. L. Mosley, of Beaumont Park, Huddersfield; and Mr. B. G. Nevinson, M.A., F.Z.S., of 6, Tite Street, Chelsea, S.W., were elected Fellows. Mr. Osbert Salvin

exhibited specimens of *Ornithoptera trojana*, Staud., and *O. plateni*, Staud., received from Dr. Staudinger, and obtained in Palawan, an island between Borneo and the Philippines. He remarked that *Ornithoptera trojana* was allied to *O. brookiana*, Wall. Mr. R. M'Lachlan exhibited, and made remarks on, seven examples of *Æschna borealis*, Zett., a little-known species of European Dragonflies. He said that some of the specimens were captured by himself at Rannoch, Scotland, in June, 1865, when he was accompanied by Dr. Sharp and the late Mr. E. C. Rye. The other specimens were taken in Luleå, North Sweden, and the Upper Engadin (5000-6000 feet), in Switzerland. Mr. W. H. B. Fletcher exhibited specimens of *Agrotis pyrophila* from various localities, including two from Portland, three from Forres of a smaller and darker form, taken by Mr. Salvage last year, and a melanic specimen from Stornoway, at first supposed to belong to *A. lucerneæ*, but which, on closer examination, was seen to be referable to this species. He also exhibited series of *Triphar orbona* from Stornoway and Forres, and *T. subsequa* from Forres and the New Forest. The specimens of *T. subsequa* from Forres were more distinctly and richly marked than those from the New Forest, and were also rather more variable in colour. Dr. Sharp exhibited specimens *Proculus goryi*, Kaup, found by Mr. Champion in Guatemala, prepared to show the rudimentary wings under the soldered elytra. Dr. Sharp called attention to the existence of a peculiar articulated papilla at the base of one of the mandibles; and he also showed sections of the head of *Neleus interruptus* displaying this papilla, as well as the articulated teeth on the mandibles. The Rev. Canon Fowler exhibited specimens of *Agapanth lineatocollis*, Don, and remarked that they were able to produce a distinct stridulation by the movement of the head against the prothorax, and of the hinder part of the prothorax against the mesothorax; they were also able to produce an unpleasant scent. He further remarked that Dr. Chapman had lately informed him that *Erirrhinus maculatus*, F., had the power of stridulating strongly developed. He also exhibited a specimen of *Barynotus* taken in Norfolk, which was apparently an abnormal example of *B. obscurus*. Mr. Edward Saunders exhibited, on behalf of Mr. G. A. J. Rothney, an illustration of his paper on Indian Ants, specimens of the following:—*Camponotus compressus* and fragments of *Solenopsis geminatus* destroyed by it; *Camponotus* sp.?, with a mimicking spider (*Salticus* sp.); *Pseudomyrma bicolor*, with its mimicking *Salticus*, and a new species of *Rhinopsis*, viz. *ruficornis*, Cameron, also found with it, and closely resembling its host; *Diacamma vagans*; *Holcomyrma indicus*, with specimens of the grain which it stores and the chaff which it rejects; and *Aphanogaster* sp. with the pieces of *Mimosa*, &c., with which it covers its nest. Mr. G. A. J. Rothney communicated a paper entitled "Notes on Indian Ants." Mr. Lionel de Nicéville communicated a paper entitled "Notes regarding *Delias sanaca*, Moore, a Western Himalayan Butterfly." Capt. H. J. Elwes communicated a note in support of the views expressed by Mr. de Nicéville in his paper.—H. GOSS and W. W. FOWLER, Joint Hon. Secs.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—28th March, 1889.—T. R. Billups, President, in the chair. Messrs. J. E. Cutts, of Watford, W. T. Sturt, of Kingston, and W. G. Macmurdock, of Wanstead, were elected members. Mr. Hawes exhibited a variety of *Epinephele ianira* with additional spots on the primaries, and two varieties

of *Zygæna filipendulæ*, both having the central spots and upper spot of the outer pair absent, and the inner pair of spots being very much contracted: the two examples were captured in July, 1876, near Oakleigh Park. Mr. Tugwell, specimens of *Deilephila galii*, bred by him from a large number of larvæ taken at Deal in 1888, together with continental examples of the species, and remarked that the most probable explanation of the unusual abundance of *D. galii* last season was that of immigration, and it had occurred to him that the specimens of the moth taken in the early part of the year were from continentally-fed larvæ; he had, therefore, written to most of the captors of the species, and he found that the measurements of the females ranged from $3\frac{1}{8}$ in. to $3\frac{3}{8}$ in., while out of a total of ninety-two males and females, about two-thirds being the latter, bred by him from English-fed larvæ, the largest was $3\frac{1}{16}$ in.; one, however, had been bred at Liverpool, which measured $3\frac{3}{8}$ in.: this difference of nearly $\frac{1}{8}$ in., in his opinion, clearly proved that the bulk of the 1888 captured specimens had immigrated to England. Mr. Billups exhibited exotic Orthoptera, Hemiptera, and Homoptera, and three species of Coleoptera:—*Sagra buquetii* from Java, *S. chrysochlora* from Australia, and *S. cæruleata* from Madagascar. Mr. W. West, two specimens of *Calosoma sycophanta* (male and female), one captured, 1873, at Freshwater Bay, and the other in Greenwich Park, 1888. The remainder of the evening was devoted to an exhibition of microscopical objects by the members.

11th April.—The President in the chair. Messrs. A. W. Dennis, of Kingsland, and G. E. Dench, of Tufnell Park, were elected members. Mr. Tugwell exhibited a bred series of *Nyssia hispidaria*, showing extreme forms of dark coloration; and a bred series of *Teniocampa leucographa*. Mr. R. Adkin, *Euchromia mygindana*, *E. arbutella*, and *Coccys nemorivaga*, bred from larvæ in shoots of the common bearberry (*Arctostaphylos uva-ursi*) from Forres. Mr. South, series of *Plusia iota*, including two of the variety *percontationis*, *P. pulchrina*, and made some remarks on the differences between the two species; two series of *Epunda lichenea*, one from Plymouth and the other from Portland; the specimens from the first-mentioned locality were fairly typical, the others were small greenish grey specimens, with but little, if any, of the pink or reddish tinge characteristic of the type; *Eubolia limitata* and *Bupalus piniaria* from various localities, and made observations thereon. Mr. Jenner Weir, some butterflies, which he had desquamated by the "Waterhouse process," and remarked that although the scales of the wings were dissolved, yet the hairs remained unaffected, and that the green pattern on the wings of such butterflies as *Papilio lurkinus* and *Tirumala petiverana* retained their colour after the desquamation; the markings were not merely superficial in these insects. A paper, "On the origin of the genus *Anthocharis*," by Mr. T. D. A. Cockerell, was read. Mr. Cockerell was of opinion that the genus *Anthocharis* was by no means an ancient genus, and that it arose directly from an old *Pieris* stock, and that probably on the American continent. Messrs. Weir, South, and Tutt made some observations on Mr. Cockerell's paper. Mr. Wilkinson exhibited several species of scorpions; and Mr. White, some of the larger species of Arachnida.—H. W. BARKER, *Hon. Sec.*

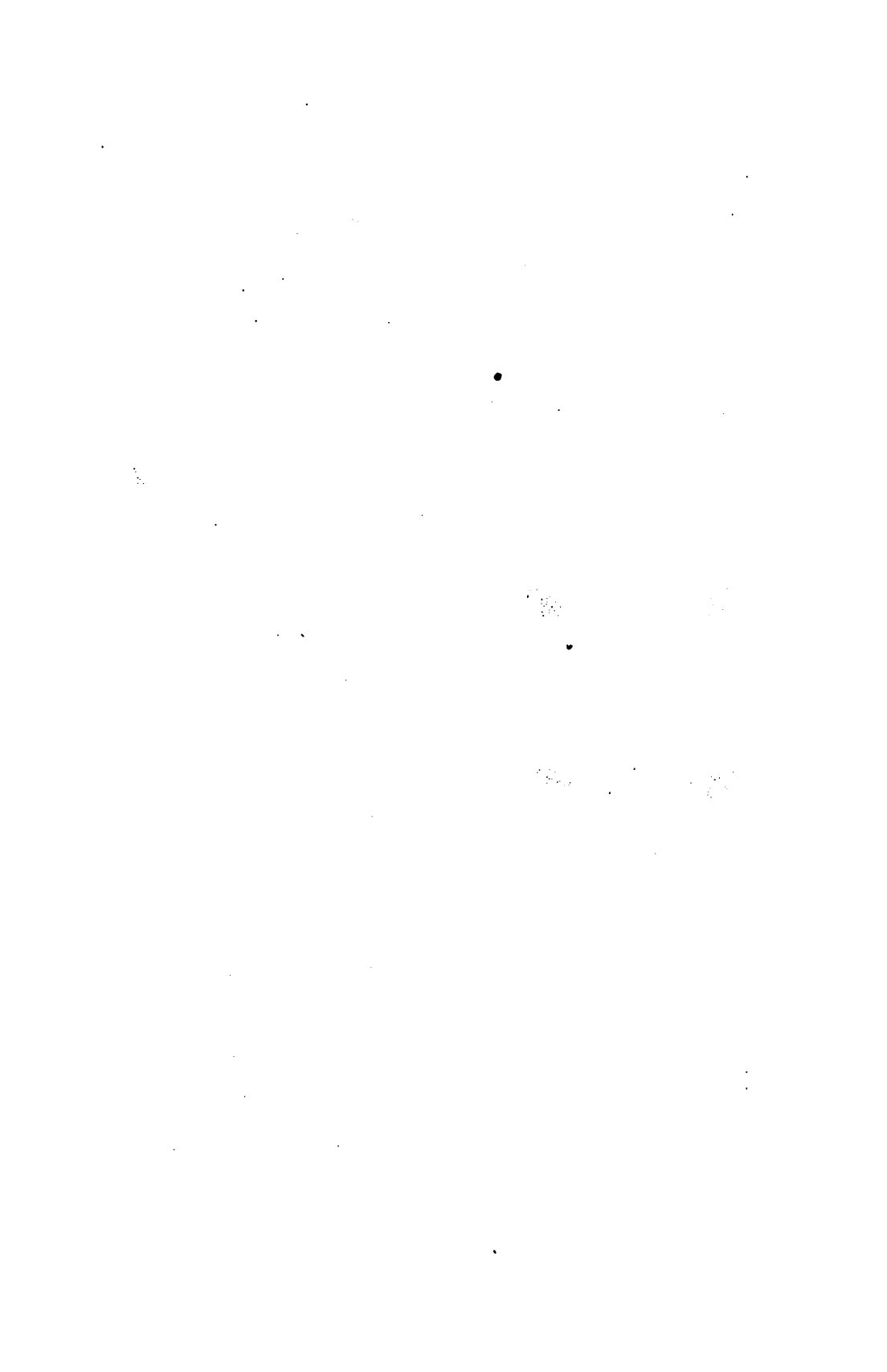
BIRMINGHAM ENTOMOLOGICAL SOCIETY.—This Society which was recently started, has already held several meetings in a room at the Medical Institute, Birmingham, which has been secured for the Society by its

Council. Interesting papers have been read, and exhibitions of specimens made. The attendance at the meetings has been good, but additional members are much wanted, in order to place the Council in a position to purchase books for a library, and otherwise carry out necessary work. Entomologists wishing to join are requested to communicate with the Hon. Sec., McCOLBRAN J. WAINWRIGHT, Hall Road, Handsworth, near Birmingham.

ABERDEEN WORKING MEN'S NATURAL HISTORY SOCIETY.—This Society has been formed for the development of Natural-History study in the neighbourhood of Aberdeen. Among the supporters we notice the name of that well-known entomologist, Professor J. W. H. Trail. The first annual Exhibition was held on four evenings in March last, when Entomology was represented by half a dozen or more exhibitors. The address of the Secretary is Mr. ANDREW MATTHEW; 93, Skene Street, Wales Street, Aberdeen.

OBITUARY.

DR. VICTOR SIGNORET died on the 3rd April, as I am informed by a letter from Mons. L. Fairmaire, who deploras the loss of a friend of forty-eight years' standing. Dr. Signoret was a well-known hemipterist of repute, wherever the study of Entomology was cultivated. I do not know the date of his birth, or other private particulars; but the work he accomplished is in our libraries, and that work is careful and thorough. The first paper written by Dr. Signoret bears the date of 1847. It relates to the order Rhynchota and to the suborder Homoptera. Since that time to quite recently, before an insidious disease paralysed faculties that had always been active, a series of faunistic and descriptive papers appeared, with that rhythmical sequence that always denotes the life of the persistent student of our science. For entomologists, as a rule, cannot study without publishing; species and genera must be distinguished; and to prove of universal application must be registered in the only way that civilised man attacks the problem of ultimate knowledge. Of the papers written by Dr. Signoret, certainly not the least important are his '*Revue iconographique des Tettigonides*,' which was commenced in 1852; and '*Revision du Groupe des Cydnides*,' began in 1881 and completed in 1883. When I remember the care with which the last paper or rather series of papers were elaborated; the material so carefully manipulated and persistently followed, wherever specimens could be borrowed or figured; the continued correspondence, interrogative and suggestive; the frequent enquiries as to Walker's types, often difficult to satisfy for lack of equal comprehension of an obscure group of insects;—the thought arises that this will prove to be Signoret's greatest contribution to Entomology. I have been under no inconsiderable obligation to my late colleague: to him I have loaned specimens, information, advice, were always at disposal and frequently solicited. His writings were never disfigured by that amateur criticism which affords a retreat for mediocrity; and if one may search vain amongst them for theories, the facts will be found on which philosophical theories in Entomology can alone be founded. The names of Signoret and Signoret will ever be familiar words to the student of the Rhynchota.—W. L. DISTANT.





A1



A2



B1



B2



B3



C1



D1



C2



D2



E



F



G

West, Newman & Co. chrome

Varieties of *Triphaena comes-orbona*.

THE ENTOMOLOGIST.

[Vol. XXII.]

JUNE, 1889.

[No. 213.]

NOTES ON SOME VARIETIES OF *TRIPHLENA COMES*, Hb.
— ORBONA, Fb.

By J. A. CLARK, M.P.S., J.D.S., F.E.S.

(PLATE VI.)

In the autumn of last year I obtained a series of the variable forms of this species, together with a number of eggs. These hatched, and I reared the larvæ through the late autumn on dock leaves (*Rumex pratensis*) in a warm room, thereby avoiding the large percentage of loss which usually occurs when it is attempted to hibernate them. On December 3rd the first of the specimens appeared, and the bulk of the remainder by the 15th, a few stragglers lagging behind till the last week in January.

The result was a fine series, consisting of thirty-six specimens, the whole of which were totally different from our usual southern forms, and, *inter alia*, they presented a very considerable difference, both in shade and markings, as will be seen from the accompanying plate. The series may be divided into four main groups, and a fifth containing varieties, which can hardly be collated with any of the other forms. They are as follows:—

Group A.—The pallid or clay-coloured form, which more nearly resembles the typical South of England form than any other. This is illustrated by two examples. Fig. a, 1, where we have the markings similar to the usual South of England type, but the coloration intensified. Fig. a, 2, like fig. 1, but the fore wings more suffused with reddish colour, and the lunules on the fore wings rufous.

Group B.—Fig. b, 1. Fore wings rufous, with but indistinct markings; the submarginal line is almost absent. Fig. b, 2. A more intensified form of fig. 1, with the subterminal line very distinctly marked. Fig. b, 3. This is a beautiful variety, the fore wings having a rich, almost crimson, shade suffused over



THE ENTOMOLOGIST.

VOL. XXII.]

JUNE, 1889.

[No. 313.]

NOTES ON SOME VARIETIES OF *TRIPHÆNA COMES*, HB.,
= *ORBONA*, FB.

BY J. A. CLARK, M.P.S., L.D.S., F.E.S.

(PLATE VI.)

IN the autumn of last year I obtained a series of the variable Forbes form of this species, together with a number of ova. These hatched, and I reared the larvæ through the late autumn on dock leaves (*Rumex pratensis*) in a warm room, thereby avoiding the large percentage of loss which usually occurs when it is attempted to hibernate them. On December 3rd the first of the specimens appeared, and the bulk of the remainder by the 15th, a few stragglers lagging behind till the last week in January.

The result was a fine series, consisting of thirty-six specimens, the whole of which were totally different from our usual southern forms, and, *inter se*, they presented a very considerable difference, both in shade and markings, as will be seen from the accompanying plate. The series may be divided into four main groups, and a fifth containing varieties, which can hardly be collated with any of the other forms. They are as follows:—

Group A.—The pallid or clay-coloured form, which more nearly resembles the typical South of England form than any other. This is illustrated by two examples. Fig. A, 1, where we have the markings similar to the usual South of England type, but the coloration intensified. Fig. A, 2, like fig. 1, but the fore wings more suffused with reddish colour, and the lunules on the fore wings rufous.

Group B.—Fig. B, 1. Fore wings rufous, with but indistinct markings; the submarginal line is almost absent. Fig. B, 2. A more intensified form of fig. 1, with the subterminal line very distinctly marked. Fig. B, 3. This is a beautiful variety, the fore wings having a rich, almost crimson, shade suffused over

them; the stigmata are darker, and delicately edged with a golden line; on the costa is a dark spot, which at the first glance gives the insect the appearance of a rufous type of *Triphæna orbona*, Hufn., = *subsequa*, Hb. Closer inspection, however, proves that it is a true *T. comes*.

Group C.—Var. *curtisii*. This is a richly-coloured series, quite distinct from either of the foregoing, the colours indeed reminding one rather of *Triphæna interjecta*, Hb., than the ordinary *comes*. Fig. c, 1. The colours of the fore wings of this variety are a rich claret-red, with no dark markings, even the stigmata being only indicated by outlines of golden yellow; the hind wings are quite smoky throughout, and the black border very broad. Fig. c, 2. This is a still darker form, the fore wings being a rich ruddy umber, almost black, on the hind and inner margins, and the discoidal spots are clearly defined by fine golden outlines.

Group D.—Fig. d, 1. In this variety the general tone of the fore wings is as intense as that of c, 2, but the claret colour is giving place to a dark slate; the pale line beyond the discoidal spots is very distinct. Fig. d, 2. Here we have the clay colour of the first set, the rusty line of the second, and the rich claret-red of the third series entirely replaced by a dark slate or smoke colour, with hardly any markings at all.

Of the unclassified series, Fig. e is the most singular: it is a very rich blue-slate colour, suffused with red on the costa, all the markings, except the inner lines, being very distinctly picked out. Its great features, however, are to be found in the hind wings: the right wing is like d, 2, with the usual lunule; but the left is very much paler, and has no lunule spot at all. Fig. f. In this variety the base of the fore wings is pale, the centre is dark like d, 2, and the tip and costa paler, with the terminal bands very distinctly defined; the hind wings are a greyish yellow, the left being lighter than the right; the band is paler, and of a smoky black. Fig. g. This can hardly be referred to any of the other groups, though it more nearly resembles a redder form of fig. 2; the subterminal line is very dark and distinct, while the inner lines, too, are very clearly defined: the whole fore wing, indeed, is richly mottled with delicate lines and patches of colour; the hind wings are somewhat like the last variety, but rather brighter.

Of the series of 36 which were reared from this brood of ova, 8 belonged to group A, 14 to group B, 14 to group C, and none to D. Those of group D and the unclassified series were captured.

The intensity of the colouring of group B, and more especially of group C, cannot adequately be shown by any lithograph, as there is a warmth and depth of colouring giving them a wonderful richness, which is lost in the printing.

It is singular that while *Triphæna comes* should present such remarkable varieties,—such, indeed as would warrant their being called new species, could their various gradations be not traced southwards to the locality of the typical *comes*,—yet *Triphæna fimbria* and *T. interjecta*, bred from the same locality, present no difference in form to the southern types.

The Broadway, London Fields, N.E., March 5, 1889.

ON THE VARIATION OF INSECTS.

By T. D. A. COCKERELL.

(Continued from p. 130.)

Class II.—VARIETIES OF FORM.

a. *In the Form of the Markings.*

THESE variations, though differing apparently from any of those enumerated under Class I. (in that they are not due to a change of colour, a change of structure, or necessarily a change in the proportions of the colours), are probably not to be distinguished from them. The question at issue is briefly this—Do all variations in the markings of insects follow the same law, differing only in intensity and not in kind, or do they strike out to form new patterns, different from anything which could have arisen merely from an increase or decrease of the intensity of the pre-existing markings? Mr. Scudder has argued that the markings on the wings of Lepidoptera arose from simple dark transverse bands, which by coalescence and division, have given rise to spots, streaks, and even ocelli.* Assuming a number of transverse bands, which have been subject to a tendency to be interrupted at intervals, it is easy to see how the wings might have become ornamented with a number of equidistant spots. These spots, if allowed to coalesce either in a lateral, transverse, or oblique direction, or to become enlarged or suppressed, or “redistributed, centripetally or centrifugally” (Darwin), will probably give us all the markings that we see on the wings of insects. These spots, the result of the breaking-up of the primitive bands, are well seen in an American moth, *Tephrosia cribrataria*, Guen. According to this view, the streaked or rayed varieties (such as *Spilosoma menthastri walkeri*, Curt.; *S. urticæ radiata*, figured by Mr. C. A. Briggs (Entom. xxi. 97); *Lycæna astrarche*, var. from Surrey (Entom. xii., 185, and fig.); *L. icarus*, var. Newman, Brit. Butt., 128; *Chrysophanus phlœas*, var. (tom. cit., 115) will fall under Class I., “n. Coalescence of dark markings.”† Staudinger,

* See also Darwin, ‘Descent of Man,’ 2nd ed., pp. 428–440.

† The recently described *Metacrias strategica*, Hudson (Entom. xxii. 53), probably owes the ornamentation of its fore-wings to an ancestral “*radiata*” variation.

in his description of *S. m. walkeri*, clearly indicates its true nature. The form *zatima* or *radiata* of *S. lubricipeda* seems to occur almost exclusively in Heligoland, but to be quite usual there (see 'Naturalist, 1888, 220).

A far more puzzling variation is that of *Colias edusa* (recorded in Entom., 1878, by Mr. E. A. Fitch), in which the black spots on the fore-wings were distinctly trilobed, and at the same time the outer margins of the wings were wavy. The specimen was captured at Colchester.

b. In the shape and development of the Wings.

The outline of the wing, especially in species of Lepidoptera, is liable to considerable variation, although the varieties are generally rare. The "tails" of butterflies seem much more variable than any other point in the outline of the wings, as, for instance, in *Thais cerisyi* (varying from the form *caucasica*, L., with no tails, to the three-tailed *deyrollei*, Oberth.), and in *Chrysophanus phleas*, which has a var. *eleus*, F., described by Staudinger as "v. *caudata*, supra *nigricans*." Sometimes the wings vary in the direction of being broader or narrower, as, for instance, *Colias edusa angustior*, Entom., xi. (E. A. Fitch), which had the wings narrower and longer in proportion than is usual. The example was bred, and abnormal external conditions may have led to its peculiarity.

The late Mr. Pryer has recorded some extraordinary seasonal variation in the shape of the wings of a Japanese *Terias*. In the hibernating form, it appears, is large and has pointed wings, while the summer form is small and with rounded wings. It has been suggested, however, that there was some error in the experiments made,—that the larvæ or eggs of *T. leta* were somehow introduced into the breeding-cage, and so gave rise to imagines which were supposed to have come from eggs of *bethesba*,—but in the face of Mr. Pryer's emphatic declaration that this was not the case, it is difficult to raise that objection. At any rate it is very exceptional, and on the North-American continent, where seasonal variation is so familiar, anything like it is unknown. Mr. W. H. Edwards has kindly given me his opinion on the matter, and writes of the American *Rhopalocera*:—"I can say this, so far as my experience goes, there is no essential difference in shape of polymorphic forms of one species. What difference there is is in the lengthening or shortening of tail (*Ajax*), the greater falcation of apex (*Grapta interrogationis*): I recall no changes in this line except in these two species. But the changes are of colour, as a yellow *Colias* from an orange one, &c." (in litt. March 5th, 1888).

The development of the wings does not always take place as fully as is usual, and the consequence is that we have cripples,

pteroous forms, &c. I am disposed to consider that the semi-pterous females of certain moths arose by the perpetuation of this condition, from winged ancestors; and it is even possible that the whole order of Diptera was originally four-winged, and that the halteres represent what were once efficient flying organs, although no doubt the progenitor of all insects was wingless, or arose from a wingless form.

A wing arises in the form of a sac, which in development becomes expanded; if from any cause this sac, or part of it, fails to expand, the wing wholly or partly fails to spread to its normal size. Probably the two main factors in producing the cripples that are seen in breeding-cages are want of moisture and external injury involving a perforation of the wing-membrane; but sometimes, as in the case of the variety of *Ocneria dispar*, with the lower wings notched (Entom., 1878, 170), this peculiarity tends to become permanent, and is actually so in the female of *Orgyia antiqua* and other moths. It is, therefore, necessary to find some other cause to explain these cases, since they cannot well be the simple result of external conditions; and I have thought that an abnormal coalescence of the wing membranes may have been the origin of the peculiarity, and have become perpetuated in certain cases until it became normal.

I have note of two instances in which the hind-wings of Lepidoptera failed to develop at all, one in *Sphinx ligustri* (B. Cooper, Entom., xi. 20), and the other in *Cidaria testata* (W. C. Boyd, Entom. Soc., Nov. 5th, 1879), while Mr. South has recorded "an apparently apterous specimen" of *Zygæna filipendulæ* from Folkestone (Ent. Mo. Mag., 1887, 139).

A few cases have been put on record, in which Lepidoptera exhibited an extra wing—five in all. This has happened in *Samia cecropia*, *Limenitis populi* (Entom. Amer., vol. i., 1885, 56), and *Gonepteryx rhamni* (Ent. Mo. Mag., 1878, 189). I have never seen any of these, and so cannot easily guess at their nature; they may be either caused by the division (or apparent division) of one of the wings into two, much after the fashion of the Pterophoridae; or they may represent two coalesced ova, like the two-headed calves and other such monstrosities.

(To be continued.)

DESCRIPTION OF A NEW BUTTERFLY FROM TRINIDAD.

By W. F. KIRBY, F.E.S.

TITHOREA FLAVESCENS.

EXPANSE from $2\frac{1}{4}$ to $2\frac{1}{2}$ inches. Dark brown, with yellow markings, more or less tinged with tawny, especially towards the base. Fore wings rather pointed, the hind margin slightly oblique, very slightly sinuated, and not convex, hind wings with the hind margin regularly rounded and

slightly sinuated. Fore wings dark brown, with the principal nervus orange towards the base, and in the yellow portions of the wing; from the base run two yellow stripes, the first curves through the cell, till it descends to the median nervure, after which it is slightly interrupted before meeting the large yellow band divided by the nervures, which crosses the end of the cell towards the hind margin. Just beyond the cell is a large oblong black spot, and there is a smaller one between the 2nd and 3rd branches of the median nervure, which are generally surrounded with yellow. Below this point are two submarginal yellow spots, the upper one irregular, and the second round, above the hinder angle of the wing. The lower basal stripe is divided by the submedian and first branch of the median nervure, and extends to about four-fifths of the length of the wing. Towards the tip of the wing an oblique row of four yellow spots; the uppermost, above the submedian nervure (which is here black), is a mere streak.

Hind wings yellow, with all the borders brown, and a brown band continued beneath towards the extremity, runs from the middle of the inner margin, nearly across the wing, but ceases before reaching the border. Under surface similar, but the yellow markings are paler, and rather more extended, most of those on the fore wings being confluent; hind wings with a row of submarginal white spots between the nervures, most of them arranged in pairs; hind wings with a curved subcostal basal stripe. Head spotted with white, orbits white; antennæ fulvous, black towards the base. Thorax with fulvous hairs above; the sides spotted with yellow; legs black, femora streaked with white, abdomen black above and yellow beneath.

This species belongs to the group of *T. harmonia*, Cram., but it is of a much paler colour than any of its allies. It is abundant in Trinidad, and is extremely constant in its markings. I have never seen it from any other locality; and like *Papilio cymochloa* Gray, and one or two other species, it appears to be peculiar to that island, which, however, is so close to the neighbouring continent of South America, that its insects properly belong to the fauna of that continent, and not to the West-Indian fauna.

Zoological Department, Brit. Mus. (Nat. Hist.), S. Kensington,
April, 1889.

LEPIDOPTERA OF WIMBLEDON.

By F. G. WHITTLE.

THE following is a list of Lepidoptera taken on, and in the neighbourhood of, Wimbledon Common; it represents my own captures, extending over more than one season:—

<i>Vanessa polychloros</i> , 24th July, not common.	<i>Sarothripus undulatus</i> , netted 1st July, 14th Aug., and 21st Sep.
<i>Lycæna argiolus</i> , 14th April and 2nd August.	<i>Hylophila prasinana</i> , larva common on oak in the autumn.
<i>Smerinthus ocellatus</i> , 15th August, larva not uncommon. <i>S. tilia</i> , larva in July.	<i>Nudaria senex</i> , 20th July.
	<i>Nemeophila russula</i> , 2nd July, uncommon near the flagstaff.

- Cossus ligniperda*, 26th June, at sugar.
Dasychira pudibunda, larva on sallow in October.
Drepana lacertinaria, larva beaten early in October, from birch on Putney Heath. *D. falcataria*, 23rd June, at a gas lamp. *D. binaria*, larvæ are rather common, early in October, on oak.
Cilix glaucata, 2nd August, at rest on whitethorn, Putney Heath.
Pterostoma palpina, 19th August, at a gas lamp.
Lophopteryx camelina, larvæ are common on oak in September.
Notodonta dictæoides, once on 21st July, clasping an elm twig in Stag Lane. *N. ziczac*, 3rd September, one larva beaten from sallow in the ravine.
Thyatira derasa, 16th July, at sugar.
T. batis, 7th July, at sugar.
Cymatophora duplaris, 7th July, on the wing.
Asphalia flavicornis, 4th March, one only on Putney Heath.
Hydræcia nictitans, 7th and 21st August, common at sugar.
Cerigo matura, 28th July, at sugar.
Caradrina morpheus, 5th July on the wing.
Agrotis puta, 24th August, at sugar.
A. saucia, 27th September, at sugar. *A. nigricans*, 26th July, at sugar.
Noctuella glareosa, 7th September, common at sugar. *N. plecta*, 19th August, at sugar. *N. cnigrum*, 3rd September, at sugar. *N. umbrosa*, 25th August, at sugar.
Triphana ianthina and *fimbria*, April, larvæ on nettles in Stag Lane.
T. interjecta, 19th August, on the wing.
Taniocampa gracilis, 10th April, at sallow catkins.
Orthosia lota, larva on blackthorn in May.
Anchocelis litura, 21st September, at sugar.
Xanthia fulvago, 24th September, at sugar. *X. flavago*, 17th September, at sugar.
Tethea subtusa, 30th August, on a fence in Kingston Vale.
Calymnia diffinis, on sugared elms in Stag Lane.
Miselia oxyacanthæ, larva in May.
Hadena protea, 2nd September, at sugar. *H. dentina*, 21st July, at sugar.
Xylocampa areola, reared a nice series from ova deposited by a moth taken in April.
Culocampa vetusta, 27th September, at sugar.
Heliaca tenebrata, 23rd May, near the Beverley brook.
Catocala nupta, a pupa under willow bark in August.
Epione apiciaria, a larva taken from willow on the 15th August, produced a moth on 9th September.
Angerona prunaria, netted 17th July.
Pericallia syringaria, netted 10th July.
Eugonia alniaria, pupa under willow bark, 17th August.
Amphidasys strataria, 8th April, on a fence in Kingston Vale.
Geometra papilionaria, 8th July, a female hovering over hazel.
Zonosoma porata, 3rd August. *Z. punctaria*, larva very common.
Acidalia imitaria, netted 9th July.
A. emarginata, netted 18th July.
Timandra amataria, 21st June, near the Beverley brook.
Aspilates strigillaria, netted, 3rd June.
Larentia multistrigaria, 10th April, common at gas lamps.
Eupithecia eziguata, at rest, 21st June.
Coremia designata, beaten, 13th June.
Scotosia vetulata, netted, 18th July.
Pelurga comitata, netted, 8th Aug., in Stag Lane.
Eubolia cervinata, 1st October, at a gas lamp.
Endotricha flammealis, 3rd August, abundant.

- Ebulea verbascalis*, netted, 3rd Aug.
E. sambucalis, 22nd June, at rest on a fence.
Scopula ferrugalis, 31st August, at rest, Putney Hill.
Crambus pinellus, 9th August, rather common.
Dichelia grotiana, 23rd July.
Leptogramma literana, 22nd August, a single example on an oak trunk.
Peronea variegana, 25th July, common.
Penthina pruniana, 25th June.
Antithesia salicella, 2nd July, on a fence in Alton Lane.
Aspis udmanniana, 23rd June, among bramble.
Sideria achatana, 22nd July.
Phtheocroa rugosana, 15th May, among bryony in Stag Lane.
Grapholitha subocellana, 30th May,
G. minutana, 15th July, not uncommon on fences in Alton Lane.
Padisca bilunana, 9th June, common on birch trunks. *P. solandriana*, an interesting series bred from larvæ found between leaves of birch.
Semasia wæberiana, 1st July, on a fence at Putney.
Coccyx argyranæ, 8th June, oak trunks in Richmond Park.
Stigmonota perlepidana, 7th May.
S. regiana, 11th July, on a fence at Putney.
Pyrodes rheediella, beaten, 14th May.
Catoptria albersana, 27th May.
Dasystoma salicella, 29th March.
Micropteryx subpurpurella, 20th May.
Adela cuprella, 23rd April, flying over fallows.
Harpiteryx xylostella, 1st August.
Dasycera olivierella, 18th July.
- 2, Cambridge Terrace, Lupus Street, S.W., 1889.

CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.

By J. W. TUTT, F.E.S.

(Continued from p. 138.)

Charæas, St., *graminis*, L.

The type of this species is described by Linnæus in 'Systema Naturæ' (10th edition), p. 506, No. 50, as, "*Bombus spirilinguis alis depressis griseis: linea ramosa lunulæ glaucis.*" It is a most variable species, not only in ground colour, which varies from a dull grey through different shades brown to a ferruginous red, but in the character and quantity the pale markings. The type has the branched central line arreniform glaucous; most British specimens have them white whilst others have only the forked end of the central line arreniform white, the base of the line and branches being almost of the ground colour, whilst, on the other hand, I have specimens in which the white median nervure develops into a broad band with many branches, running longitudinally through the centre of the wing from the base to beyond the arreniform. As in all this family, there is great variation in the size and shape of the stigmata, and the females are, as a rule, much larger, and less liable to variation than the males. Mr. Porritt writes me that

"red and grey forms in both sexes occur in the Huddersfield district." There are numbers of intermediate forms, but the following are some of the most striking forms that have been described:—

1. Grey, with branched central line and stigmata glaucous, = *graminis*, L.

2. Grey, with white three-branched central line, stigmata yellowish, = *gramineus*, Haw.

3. Red-brown, with ochreous ramose central line, ochreous stigmata, = *tricuspis*, Esp., ♂.

4. Red-brown, with white ramose central line, whitish stigmata, = *tricuspis*, Hb., = var. *rufa*.

5. Grey, with red costa, with ochreous ramose central line, ochreous stigmata, = *graminis*, Hb., = var. *rufo-costa*.

6. Dull yellowish brown, with ochreous ramose central line, ochreous stigmata, = *hibernicus*, Curt.

7. Pale ochreous yellow, with dark nervures, white orbicular and reniform with a bifid line joining base of reniform, = *tricuspis*, Esp., ♀, = var. *ochrea*.

The first five make the only reasonable method of arrangement of the varieties which can be readily adopted, and include most of the general forms. From Curtis's figure, pl. 451, it can be seen that No. 6 is only an extreme modification of No. 3, and I have never seen an extreme form like No. 7, although Mr. Dobrée has it from Southern Germany. Two other marked forms occur: one unicolorous dull grey-brown, with all the ordinary pale transverse lines of the same colour as the rest of the wings, but slightly paler, the whitish reniform and a white blotch at its base alone being distinct of all the original markings; another form has the central ramose line developed into a large white blotch. In Humphrey & Westwood's 'British Moths,' p. 113, we find:—"Varieties occur with the fore wings of a uniform colour, except the pale yellow marks and stigmata; and others have the latter markings edged with black on a plain ground."

α. var. *gramineus*, Haw.—No. 2, above. This is described by Haworth as, "Alis griseis linea trifurca alba, stigmatibus pallidis, lineolisque acutis ad apicem atris." "Affinis præcedentibus (*popularis*) at duplo minor; antennis ferrugineis minus pectinatis et absque strigis moniliformibus. Maris alæ anticæ griseæ linea media trifurca albida a basi post-medium ducta; supra lineam maculis tribus nigris difformibus parvis et stigmata ordinaria lutescentia circulo pallidiore: subtus lineam macula altera nigra trigona, et stigma tertium teliforme lutescente nigro cinctum sed aliquo interruptum; subtus hoc stigma lineola nigra ad marginem tenuiorem prope basin. Ordo transversus punctorum nigrorum cuspidatorum versus marginem posticum. Alæ posticæ fuscæ, ciliis flavicantibus" ("Lepidoptera Britannica," pp. 117, 118). This is probably the most common form

occurring in Britain. I have it from Glasgow, Sligo, Yorks, and many other localities, north and south.

β. var. tricuspis, Esp. No. 3, above. Esper's *tricuspis*, pl. lxviii., figs. 2 and 3, may be described as follows:—Fig. 2, ♂. "Anterior wings deep reddish brown, with a short, two-forked, longitudinal, basal mark starting from centre of thorax; between this and the base, and extending along the median nervure, is an ochreous longitudinal blotch, which is in contact with the orbicular and reniform, the blotch branching beyond the reniform. All the markings dull ochreous grey." Esper's fig. 3 is a pale ochreous form, which he calls a ♀, but from the tufted anal segment it would appear to be a ♂. Of *tricuspis*, Esp., Guenée writes:—"The ordinary stigmata and the bidentate spot confluent, also the claviform, and prolonged in bright yellow almost to the base of the wing" ('Noctuelles,' vol. v., p. 176.) This should include all reddish forms with ochreous markings. I have this variety from Sligo, Glasgow, Morpeth, &c. Continental lepidopterists often send out as *tricuspis*, Esp., varieties which differ very much from Esper's figure; many of the specimens have a white central line instead of ochreous, and others are more like Haworth's *gramineus*.

γ. var. rufa, mihi.—No. 4, above. This is Hübner's *tricuspis*, fig. 143, which may be described as:—"Anterior wings dark reddish, with a pale streak below the costa; orbicular indistinct; the pale median nervure, touching the base of the orbicular and reniform, makes at the base of the reniform two distinct white branches; the wedge-shaped spots parallel to the hind margin are preceded by a pale band." Of this variety Guenée says:—"Hübner's fig. 143 is a strongly-marked variety, but entirely accidental" ('Noctuelles,' v. p. 176j. Staudinger's description of *tricuspis*, Esp., does not apply so well to that form as to *var. rufa*. He says:—"Al. ant. unicolor rufescentibus, mac. magna trifida alba." This name should include all red forms with white markings. I have this variety from Sligo, Glasgow, Yorkshire, &c.

δ. var. rufo-costa, mihi. No. 5, above. This is Hübner's *graminis*, fig. 480, which may be described as:—"Anterior wings grey, with bright red costa from base to apex; stigmata ochreous, median nervure branched, ochreous; that part of the wing just around the stigmata dark reddish brown; beyond the reniform a broad red patch extends from the costa to the inner margin; the ordinary row of wedge-shaped spots parallel to the hind margin." I would include all forms with a red costa under this name. I have only specimens from the Hebrides of this variety, but it undoubtedly occurs elsewhere.

ε. var. hibernicus, Curt.—Curtis's description ('British Entomology,' p. 451) is as follows:—"Dull yellowish brown; superior wings with an elongated pale ochreous spot at the base above the central nervure, and another subelliptical one more towards the middle, with a lemon-shaped one above it; beyond the middle is a trapezoid spot resting on a trifid character all of the same pale colour, some of them being partially relieved by a dark brown; between the nervures at the posterior margin are obscure, elongate-trigunate brown marks; abdomen and inferior wings fuscous, cilia pale ochreous. I am fully aware that *C. graminis* is a most variable species; but as I have never seen one similar to the specimen figured, I consider it may be a distinct species. It was captured last September in the county of Mayo, Ireland." I have this variety from

Mr. Russ, of Sligo; and Mr. Gregson (Entom. iv. 51) records it from Staleybridge Brushes.

ζ. var. *ochrea*, mihi.—No. 7, above. Anterior wings of a pale ochreous yellow, with dark nervures, with whitish or ochreous reniform and orbicular, the former joined with a bifid line, the extension of the pale central line. It is figured by Esper as a ♀ of var. *tricuspis*. I have never seen specimens of this variety. The nearest approach that I have to this form came from Mr. Russ, of Sligo.

η. var. *obsoleta*, mihi.—Anterior wings unicolorous dark grey, with no pale markings whatever, except the trifid mark made up of the reniform, and a bifid patch joined below it. I have this variety from Mr. Finlay, of Morpeth, Mr. Russ, of Sligo, and it is obtained by Mr. Harrison, of Barnsley.

θ. var. *pallida*, mihi.—Anterior wings dark grey, but the white central median line developed into a broad white band, including the claviform, orbicular, and reniform, and extending over the whole of the centre of the wing. I have this variety from Sligo and Yorkshire localities.

ι. var. *megala*, Alph.—In 1883 Dr. Staudinger had in his trade list a doubtful variety of this species from Turkestan. The name I find is also retained (as a distinct species, however) in the last trade catalogue of Herr Heyne, Leipzig. Of this variety Mr. Dobrée writes:—"I obtained a male, which is small, and closely resembles *tricuspis*, Esp., differing only in that the ground colour, blotch, and markings are all fainter, giving the insect a more generally unicolorous look."

κ. var. *albinea*, Bdv.—Boisduval, in his 'Icones, &c.', pl. 74, fig. 4, figures a variety of *graminis*, which I have been unable to refer to. In his 'Noctuelles,' vol. v., p. 176, Guenée writes, "I have not seen in nature Boisduval's *albinea*, which appears to be simply a variety of *graminis*;" and in the 'Entomologisk Tidskrift,' 1884, p. 161, referring to this variety, Herr Sven writes, "Liknär hufvudformen, men cellerna äro svarta uti framvingarnes basal-och mellansält, samt nära utkanten."

λ. var. *albipuncta*, Sven.—Herr Sven, 'Entomologisk Tidskrift,' 1884, p. 161, describes a variety as, "framvingarne rödbruna, med svartaktiga ribbor, samt en hvit punkt i njurfläckens bakkant, ♀, Sällsynt."

μ. var. *brunnea*, Sven.—Sven, 'Entomologisk Tidskrift,' 1884, p. 161, describes his var. *brunnea* as, "framvingarnes grundfärg rödbrun." "Hvad framvingarnes teckningar angår, så äro äfven dessa underkastade måndfaldiga variationer, Bland de många exemplar, Lektor Sven insamlat, äro nedanstående afvikande former de anmärkningsvärdaste."

Pachetra, Gn., *leucophæa*, View.

Vieweg, in his 'Tabellarisches Verzeichniss,' &c., p. 23, No. 28, thus describes the type of this species:—"Noctua *leucophæa* alis incumbentibus dentatis griseo fuscoque variegatis, maculis ordinariis albidis." This short Latin diagnosis he follows up with a much fuller description in German, as follows:—"The antennæ of the males are pectinated. The toothed fore wings are whitish grey, with darker shades. In the middle of the wing are an orbicular and reniform stigma, both of a whitish colour. Beneath the orbicular stigma is a black mark, like a Greek v. Near the hind margin runs a whitish transverse line, with a row of black

triangular spots, pointing to the base of the wing. The hind margin is black and white-spotted. The hind wings are grey. Under side of fore and hind wings with a dark spot and a transverse line." This species is very rare in Britain, although most cabinets contain specimens, which their possessors *believe* are British. On the Continent, however, the species is in many places common. Hübner, under the name of *leucophæa*, figures (fig. 80) a specimen of a pale grey ground colour, with a much darker central band, having a purplish tinge. The darker markings, however, are much as in the figure in Newman's 'British Moths,' p. 295, but there are only two of the black wedge-shaped spots parallel to the hind margin. The specimen is a large female. Geyer, in his supplement to Hübner's 'Schmet, &c.,' figures (817) another female, of bad shape, but purplish in colour. Fabricius describes this species under the name of *fulminea*, his description of the species agreeing almost precisely with that of Vieweg. It is as follows:—"Bombyx alis incumbētibus dentatis griseo fuscoque variegatis, thorace antice albo; striga nigra" ('Entomologia systematica,' &c., p. 484, No. 241). Newman, in his 'British Moths,' p. 295, says, "tinged with ochreous," which has been the case with several specimens I have seen. These "ochreous-tinged" specimens would appear to be Hübner's *vestigialis* (described below), whilst a peculiar slaty form, with dark red central band, is figured by the same author under the name of *ravida*. It is also the ochreous form which is the *leucophæa* of Guenée's 'Noctuelles,' vol. v., p. 177, where he writes, "Superior wings of a greyish white, tinged in places with yellowish, and shaded with brownish black," &c. Taking the white and fuscous form as the type, there seem to be the following varieties noted by other authors:—

1. Speckled with ochreous, = *vestigialis*, Esp.
2. With the central area red, = *ravida*, Esp.
3. Smaller than type, = *bombycina*, Ev.

α. var. vestigialis, Esp.—Esper (vol. iii., pl. liii., fig. 5) figures a form of *leucophæa* under this name, of which I made the following description:—"Male. Pectinated antennæ; ground colour greyish brown, with yellowish nervures; a white patch at base of wing directly under costa, followed by a double whitish basal line, edged interiorly with black. Claviform of ground colour outlined in black and then with white; orbicular reaching to costa, outlined in white and then with black; reniform also outlined in white and then with black; a black wavy line from base of reniform to the inner margin; six short black costal streaks above the reniform and towards the apex; a series of black wedge-shaped spots parallel to hind margin; fringes alternately dark and pale grey. Hind wings grey, paler in centre and towards the upper margin; lunule in this paler space, dark hind margin, extreme outer edge whitish." His figure 4 on the same plate is a female, "much more brightly marked, more variegated, orbicular not reaching costa; ground colour deeper, and with a slight reddish tinge, a wavy transverse line parallel to hind margin." This variety is, as mentioned

above, the *leucophæa* of Guenée. Under this name I would include all specimens speckled with ochreous.

β. var. *ravida*, Esp.—Esper (vol. iv., pl. 145, fig. 1) figures another variety of *leucophæa* under this name. The description I have made is as follows:—"Female. Anterior wings grey, with a slaty shade along the costa, in which are four short black costal streaks; there are two black transverse basal streaks; the claviform brown, edged with black; reniform and orbicular slaty, outlined in pale. Directly beyond reniform is a white transverse wavy line, edged internally with black; all the wing, between this transverse line and the base, tinged with reddish brown, except the costa and inner margin, which are of a slaty colour; a wavy W line parallel to the hind margin, pale, but internally edged with black. The space outside this waved line, and between it and the hind margin, deep reddish brown. Hind wings dark grey, central area paler, which contains a dark lunule, paler; immediately beyond the lunule is a dark transverse line, extreme hind margin paler." Guenée, in his 'Noctuelles,' vol. v., p. 178, writes of this variety, "all the median space reddish, lines and stigmata well marked. Between the lunule and the subterminal shade of the inferior wings is a median line. Locality, Bavaria."

γ. var. *bombycina*, Ev.—Staudinger mentions in his 'Catalogue' a variety under this name, which is there described as "minor." I know nothing of it.

(To be continued.)

ENTOMOLOGY OF ICELAND.

By REV. F. A. WALKER, D.D., F.L.S., &c.

HAVING been unable to discover any notice of the Entomological fauna of Iceland in any volume of the 'Entomologist' since its commencement, I judged that a brief *resumé* of the very imperfect knowledge that we possess on this particular subject might be acceptable to its readers.

I have studied the works on Iceland of several travellers, and also corresponded with others who have paid a visit there, with the view of definitely ascertaining the existence of butterflies. The preponderance of evidence obtained after a great deal of trouble on my part was in favour of their existence, though no particular species could be certainly ascertained. I may add that their occurrence in that Arctic region has been the subject of dispute; and that Staudinger, who visited the island more than thirty years since in 1856, has furnished a list of 33 species of moths, and of 81 beetles, 114 kinds in all, in the 'Proceedings of the Entomological Society of Stettin,' but mentioning no butterflies whatever.

The catalogue contained in the Appendix to the work on Iceland, by Paijkull, a Swede, is less satisfactory than that of Staudinger, as containing even fewer species, and also recording no butterflies, though including some Hymenoptera and

Diptera. Moreover, I believe it has not the merit of being original, but was compiled from the work or observation of some Frenchman. And among the ninety odd species here recorded are included Arachnida, Acari, &c.

I refrain from giving Staudinger's and Pajkull's lists *in extenso*, for fear of trespassing on your valuable space; but I give the following extracts, from various sources, as an addition to the knowledge that we possess on the subject of the Icelandic Fauna. At a later period of the year I hope to enlarge this knowledge by actual observation during a visit I propose to the island this summer.

(1.) "In the neighbourhood of the river (Bruarâ, or Bridge River), we saw many small butterflies, blue and white, both fluttering and flying kinds."—(Symington's 'Pen and Pencil Sketches of Faroe and Iceland, 1862.' p. 105).

(2.) "I did not see a collection of insects in the museum, but I have just heard from my friend, who reports having seen one or two butterflies, one was blue, also several beetles, and some moths." This is an extract from a letter of a correspondent of mine who visited Iceland in 1888.

(3.) "One of these swamps put me in a position of much difficulty and embarrassment during one of my solitary excursions. I was sauntering quietly along, when suddenly a little butterfly fluttered past me. It was the first I had seen in this country, and my eagerness to catch it was proportionately great. I hastened after it, thought neither of swamp nor of danger, and in the heat of the chase did not observe that the mounds became every moment fewer and further between."—Ida Pfeiffer's 'Visit to Iceland,' p. 81. Madame Pfeiffer does not add that she caught the insect in question, and it is just possible, that not being a professed entomologist, she may have mistaken a moth for a butterfly.

(4.) For the accompanying list of half-a-dozen species of butterflies reputed to occur in Iceland, I am indebted to Mr. Kirby's kindness:—*Colias pelidne*; *C. nastes*; *C. hecla*; *Argynnis freyja*; *Æneis jutta*; *Æ. æno*. I believe, however, that the existence of these species in Greenland is the only argument for their supposed existence in Iceland, Greenland and Lapland being portions of the mainland of America and Europe, and this makes all the difference.

(5.) "If the main difference between a moth and a butterfly is that the wings of the former lie flat, and those of the latter stand up right when the insects are not on the wing, then I think I may certainly assure you that there are butterflies in Iceland. I remember distinctly having chased them in my youth. Last time I was in the island, the year before last (1887), I was on the look out for moths and butterflies, knowing that the existence of the latter was disputed, but I never saw one individual of either kind all the time. I ascribed it to the fact that the country was surrounded by closely-packed Arctic ice all through July and August, the warmest months of the season; and that off and on the chilliness of the atmosphere was insufferably keen. But, in warm summers, I remember from my boyhood the fields and meadows were quite alive with winged insects; moths or butterflies, I could not say with certainty. I should have imagined, coming from my recollections, that the chief haunts of moths (and butter-

flies, if there be any), would be the manured home-fields (grass plots round the homesteads) at the time when the grass is ripe for mowing, viz., early in July, at which time the not inconsiderable number of flowers that take advantage of the shelter of the grass are also at their best. I don't think I am wrong in saying that in a cold season, which in Iceland means an 'ice-summer,'—if there is no 'ice,' the season is delightfully genial,—search for butterflies and moths should be made as far up inland valleys as the altitude of the terrain makes advisable, or midway between sea-draught and glacier-draught. In a warm season I suppose it matters little where the search is made on the lowlands of the island."—(Extract from the letter of another correspondent, who is a native of Iceland, April, 1889).

Apropos of Staudinger's list, I may add that he considers that the total sum of the species of insects found in Iceland is about 312 kinds, and that over one-third of these (110) consists of Diptera; almost one-fourth (81) of Coleoptera; one-fifth (61) of Hymenoptera; one-tenth (33) of Lepidoptera, and the other tenth of the remaining orders, to wit, 9 Homoptera, 8 Hemiptera, 6 Parasites, 3—6 Poduridæ, 29 highest total. Orthoptera are wanting.

That there are 500 species found there he decidedly does not believe. Most of the species of Coleoptera he found under stones, in turf, all the Staphylinidæ in dung, or under dead birds.

Grubs of some of the Diptera, namely Tipulidæ, and of a few Ichneumons, found on a great variety of flowers.

"Are you aware that in certain seasons in June, certain localities in Iceland are visited by the so-called 'gras-madkr,' or caterpillar plague? Unfortunately, I cannot say with any certainty what the particular atmospheric conditions are, much less what the nature of the caterpillar, or caterpillars is. This is not confined to any particular locality, but seems to be the result of the temperature. I rather fancy that the summer's product of winged insects in these localities afterwards is generally very scant. By the last accounts from Iceland, it seemed probable that the present summer might be a particularly good one, no ice having arrived on the coast at the end of March. But if the ice makes its appearance in April, a deadly summer follows."—(Additional extract from the letter of a native of Iceland, April, 1889).

I may add, in conclusion, that the gentleman from whose letter I have thus twice quoted informed me that he thought he had seen a pale yellow butterfly in his boyhood in Iceland; and also that his wife, in inspecting one of my cabinets, was under the impression that she recognised *Gonepteryx rhamni* and *Colias hyale* again.

Dun Mallard, Cricklewood, May 1st.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

COLIAS EDUSA IN SPRING.—A friend of mine saw a *Colias edusa* flying over the moat at Bramber Castle, in Sussex, on May 6th, 1889.—HAROLD MANN; 9, The Drive, Brighton, May 12th, 1889.

VANESSA ANTIOPA IN SUSSEX.—While driving through Beckley, in East Sussex, on April 29th, I saw a fine specimen of *V. antiopa*, which, although strong on the wing, obligingly rested upon a dry bank, and so enabled me to capture it.—THOS. DAWS; Ewhurst, Sussex, April 30, 1889.

VANESSA ANTIOPA IN KENT.—On May 5th, 1889, I took a female specimen of this insect in the vicarage garden of Horton Kirby, Dartford.—J. R. HALE; Horton Kirby, Dartford.

VANESSA ANTIOPA IN CAMBRIDGESHIRE.—A specimen of this butterfly was taken by me on May 4th, in a plantation near my house. It showed evidences of hybernation.—PHILIP T. GARDNER; Conington Hall, Cambridgeshire, May 4, 1889.

VARIETIES OF RHOPALOCERA IN HAMPSHIRE.—On July 24th, 1888, whilst staying at Brockenhurst, I took a fine example of the black variety of *Limenitis sibylla*. The normal form occurred in great numbers on the same occasion. On this day also, which was the only really fine one during a fortnight spent in the New Forest, *Argynis paphia*, var. *valesina*, was by no means uncommon; some dozen specimens in beautiful condition being captured. Two males of *A. paphia* were also taken, with light yellowish spots on the fore-wings, which latter form was, I believe, not very uncommon, for I heard of several other examples being taken.—H. CONQUEST; 1, Mary Villas, Greenleaf Lane, Walthamstow, May 2, 1889.

EREBIA ETHIOPS NEAR LONDON.—About the 22nd of July last a friend of mine took a fine specimen of *Erebia athiops* (*blandina*) in his garden at Brixton. It flew over the wall, and he managed to capture it in a net. As far as I know, there were only two gentlemen breeding *Erebia athiops* last summer in Brixton, and they are both able to account for all their specimens, so it cannot have escaped from their breeding-cages.—C. A. TEAROE; 14, Ducie Street, Clapham, S.W., March 13, 1889. [The specimen doubtless escaped from captivity in the neighbourhood.—ED.]

LYCÆNA CORYDON, FEMALE VAR.—On September 12th last I captured at Lulworth, Dorsetshire, a female *L. corydon*, the under side of which presented a striking variation from the general type. Instead of the usual brown the ground colour is gray, inclining to white on the four wings. The discoidal spot and the marginal series of compound eye-like spots are present on all four wings; but, besides these, there are only two other spots on each of the hind wings and none on the fore, instead of the usual eleven and nine respectively.—ALFRED T. STIFF; The Laurels, Clapham Common, S.W.

PALE VARIETY OF LYCÆNA BELLARGUS.—When the discussion concerning the pale varieties of *Lycæna bellargus* (*adonis*) was taking place (Entom. xx. pp. 207—209, 220—224, 253—260), I incidentally men-

ioned (p. 207) that the pale variety then under consideration had been previously recorded, but that I could not then find the record. When searching through the back numbers of the 'Entomologist' a short time since, I came accidentally across the record (Entom. ix. p. 253). It is by Mr. Jenner Weir, who quotes M. E. Bellier de Chavignerie, and the note dates back to August 15th, 1847. The note is to the effect that "five *adonis*, which were captured just previous to a violent thunderstorm, were of a beautiful lilac instead of the bright blue of *adonis*;" but those who are interested can easily read the whole of this most interesting note themselves. Suffice it to say that Mr. J. Jenner Weir, although not supporting the view that "electricity" was the agent, inclined to the opinion of the change of colour being due to "moisture;" and this directly supports the opinion of Mr. Briggs (Entom. xx. p. 251), who considered that the cause of these varieties should be sought for directly "in local or phytophysical causes." Considering the light that appears of late to have been thrown on the direct and indirect influence of moisture in the production of certain forms of variation, it is most interesting to find that this record should practically support that view.—J. W. TUTT; Westcombe Park.

OCNERIA DISPAR.—Up to the end of 1888, I have had in my possession a race of this species, which the late Mr. Henry Willits and I have kept for upwards of fourteen years. In 1886 I had fifteen female pupæ, from which I bred one perfect imago, and from the remainder complete or partial cripples (Entom. xix. 282). From five of these crippled specimens I obtained ova, and in 1887 I bred about 100 perfect specimens from those larvæ which I retained for myself, and had only one cripple, a male. I obtained ova from several pairs, and placed a few of these batches in localities around here to try and naturalize them, but if they have fared the same as mine the result will be *nil*. I reserved one batch for myself which emerged on May 13th of this year. The greater part pupated during the last week in August, but on October 21st I had eight larvæ feeding on withered whitethorn, there being no fresh procurable, which have since died, though they were then only about half-grown. I have had but one male out on September 24th. At the beginning of November, though the pupæ were alive, I felt anxious lest a night or two's frost might prove fatal to them, and wishing them to emerge I brought them into a room with a fire. All the pupæ have now died and shrivelled up, though not by any means kept too hot, and I have thus lost a brood which I have reason to believe was of British extraction. I see the late Mr. Buckler, in his 'Larvæ of British Butterflies and Moths,' vol. ii., p. 32, comes to the same conclusion with respect to forcing *Deilephila* when the weather was mild, as I have done with my *Ocneria dispar*, viz., "that I ought not to have begun the forcing till the weather had become dry and frosty, then the heat would have had due effect; but, as it was, the great humidity of the atmosphere had prevented this, and sufficient heat had not reached the pupæ to develop the imagines in them at once." Of course these remarks apply to an insect which in a state of nature remains through winter in the pupa state, whereas *O. dispar* is in the ova stage; but the reason holds good for each, and, doubtless, if I had waited for colder weather, I should have succeeded in getting at least a few out, as the pupæ were lively enough till I took them indoors, and twisted around in their skins when touched, as noticed by Kirby and Spence in their 'Introduct-

tion to Entomology,' vol. ii. p. 295.—A. E. HALL; Norbury, Sheffield, Dec. 10, 1888.

OCNERIA DISPAR.—Before last summer I had bred many of this insect, with the too general result,—three out of every four, or thereabouts, proved to be "cripples" on emergence. Last summer I bred upwards of 150 larvæ, and tried another plan. I left the pupæ in the places in my inverted bell-glasses, where they spun up and never in any way interfered with or touched them. The result was, that out of over 130 emergences, I had but some half-dozen "cripples." Whether this is the solution of the difficulty in rearing *O. dispar*, perhaps other readers may endeavour to prove during this coming summer.—(Rev.) J. SEYMOUR ST. JOHN; 42, Castlewood, Road, Stamford Hill, N., March 16, 1889.

PANOLIS PINIPERDA IN IRELAND.—It may interest some of your Irish readers to know that I took two specimens of *Panolis piniperda* at Howth, on the trunks of two Scotch firs, on April 14th. Newman states that it is not reported from Ireland, but I understand that it has been taken at Wicklow since his time. I should like to know any particulars about its occurrence in this country.—Geo. W. HART; 14, Lower Pembroke Street, April 16, 1889.

CARADRINA QUADRIPUNCTATA.—On the 9th of this month a specimen of the above moth was found flying in one of the rooms in this house; it appeared to be very recently emerged. Newman states that the larva passes the winter in its "cubiculum," and does not change to the pupa stage till May, the moth appearing a few weeks later. It seems fairly certain that in the present case the larva pupated about the middle of the winter, the imago emerging a few weeks later. Probably the larva "made up" in some warm spot, which induced it to undergo its transformations so prematurely. I suppose *C. quadripunctata* has never been known to hibernates in the imago stage? Newman states that the larva feeds on "farinaceous and leguminous crops." I remember a few years ago, in the autumn, finding a half-grown larva feeding inside a pear: I put the pear, with its occupant, inside a box which was afterwards mislaid. Next summer the box turned up, and it was found that the insect had duly emerged as this species; so that *C. quadripunctata* appears to be a very general feeder, and capable of doing much damage to crops, if present in great numbers.—E. W. H. BLAGG; Greenhill, Cheadle, Staffordshire, March 12, 1889.

AMPHIDASYS BETULARIA, BUFF VAR.—In reply to Mr. Joseph Chappell (Entom. 113) respecting this remarkable variety that was often bred by Middleton collectors, as he says, it would be interesting to know something of their history, and whether the same has been lost. As some entomologists, I understand, believed them to have been manufactured, I will give a short history of them. In 1874, Thomas Lomas and Jonathan Fielding, two members of our local Entomological Society, captured near Heaton Park a buff female *in copula* with a black male. After depositing ova, the female was sold to a London dealer, the ova being taken great care of, and the larva fed up well. Many buff varieties were expected to turn up from this brood that emerged from the pupæ in 1875, but the breeders were disappointed, for not a single buff variety turned up, all being black and ordinary forms. B
disappointed, and having no idea the buff forms might reappear,
several collectors virgin females to cross with black males,

which were being bred very freely at this time in Middleton. I was commissioned by the late Henry Doubleday to purchase all black ones that some six or seven collectors were breeding. I understood he sent them on to the Continent. This crossing was so favourable to the re-appearance of the buff variety that no less than seven collectors, who had had virgin females given to them to cross with black males, produced the buff variety in 1876; the proportion being about 10 per cent. Many of these collectors crossed them again with poor success. Lomas and Fielding, who had the greatest number, did not try crossing again, but bred them in and in, and from this breeding no less than 80 per cent. of buff moths turned up in 1877. In these moths of 1877 there was every form of variation, from pure buff to the ordinary type. After that year they gradually grew weaker, and in the course of three years following, the strain was totally lost, and not a single buff variety has been produced since. These varieties were exhibited at the monthly meetings of the Middleton Society in May and June for several years, many of them being alive and in copulation. Any amount of evidence can be obtained from collectors who saw them while being bred and exhibited alive as proof of their genuineness. They were never kept secret, every specimen being shown to any entomologist who wished to see them. Mr. C. S. Gregson, of Liverpool, came several times. After some time a certain London dealer came over very late one Saturday evening; the day following I myself took him to see Fielding's lot of buff varieties. At this time the great bulk were in the hands of Fielding and Lomas. After much persuasion and promise of some extraordinary foreign butterflies for "picture-making," the dealer got every specimen that Fielding had got; but when the case of foreign butterflies arrived, they were not worth the cost of carriage. This so disgusted Fielding that he gave up collecting. Some time after I purchased Lomas' collection, including every specimen of the buff variety he had bred, with the exception of two I had understood he had sold to Mr. Bond. With the exception of two or three specimens in several collections in Middleton, and a few I have given to entomological friends in different parts, including two to the British Museum collection, I possess the whole of what remains of these varieties. This form has not since been bred, and seems to be quite lost.—JOHN THORPE; Middleton. Lancashire, April 23, 1889.

TORTRIX CRATEGANA IN HAMPSHIRE.—I obtained this interesting, and not usually common species, in numbers and in fine condition on the 16th July, 1888, whilst beating for larvæ in Hurst Hill Enclosure, in the New Forest. They were dislodged from the oaks in company with *T. podana*, *T. sorbiana*, and *T. xylosteana*; but *T. crategana* was on this particular day by far the most plentiful of the species named.—HAROLD CONQUEST; 1, Mary Villas, Greenleaf Lane, Walthamstow, May 2nd, 1889.

SERICORIS URTICANA, VAR. *Rufa*.—Everywhere in Kent the larvæ of *Sericoris urticana* last year appeared to be more than usually abundant, and in June I bred a long series from larvæ obtained in different localities. These were all of a greenish or whitish grey ground colour with one exception, and this satisfied the description in Stainton's 'Manual,' vol. ii. p. 263, where the ground colour is said to be "pale reddish grey." Whilst at Deal in the early part of July, I took a number of larvæ on *Hippophæ hamnoides*, some of which produced at the end of the month a series of

what are, from the markings, a striking, deep red variety of *S. urticana*. They are somewhat smaller than the other specimens in my series, the ground colour very red, the markings appear darker and more distinct. I think it advisable to put this local form on record and should be pleased to hear if such a form is found in any other locality. Are the moorland forms anything like this?—J. W. TUTT; Westcombe Park.

NEPTICULA MINUSCULELLA.—During 1887 I found a number of mines in the pear leaves. A few moths came out in 1888, and this year six more have now emerged. I may add I could not find a single mine last season. No doubt very few moths came out last year, owing to the wet and cold weather; and possibly the rest remained over for more favourable times, as indicated by my specimens.—J. B. HODGKINSON; Ashton-on-Ribble, April 6.

PSYCHODA CONSPICILLATA IN NEW ZEALAND.—Doubtless some of your readers who make the Diptera their especial study, will be able to throw some light on the following fragmentary observations made during last winter, on the natural history of the above insect. On July 30th I noticed a large number of *Psychoda conspicillata* in a cage containing larvæ of *Agrotis nullifera*. I concluded that they had resulted from a large assemblage of small dipterous larvæ, observed on one of the blades of the speargrass about a month previously. From the uniform size of these larvæ, and the fact that I had not observed them before, I supposed that they had eaten their way out of one of the *A. nullifera* larvæ, but did not notice any remains of the larva. I distinctly recollect, however, that the dipterous larvæ were in one mass when first seen, as if they had all emerged together, but that they afterwards dispersed and buried themselves. On July 31st I examined some of the earth in the cage, and discovered several minute dipterous pupæ, which I isolated in a glass-topped box. These pupæ emerged as *P. conspicillata* on August 8th, at which time the flies were to be seen in great numbers about the houses in Wellington, in the bush and in fact almost everywhere. Hence I feel sure that the insect cannot habitually be a parasite of *Agrotis nullifera*, as the comparative rarity of that insect forbids it, although the above evidence seems to indicate such to be the case. Where, therefore, does *Psychoda conspicillata* generally spend its larval state?—G. V. HUDSON; Wellington, New Zealand, March 19, 1889.

THE COLD SUMMER OF 1888, AND DOUBLE-BROODED MOTHS.—My experience this season hitherto does not coincide with that of your correspondent (Entom. 140). *Selenia bilunaria* has been common in this neighbourhood. I have also seen numbers of *Tephrosia crepuscularia*. Many of the single-brooded Lepidoptera, whose larvæ must have experienced some of the cold of last summer, have been abundant, as *Taniocampa pulverulenta*, *T. gothica*, and *T. stabilis*. I have, however, certainly expected the same results as your correspondent, for in one locality, namely, in Gloucestershire, on the Cotswolds, a frost occurred on one night in July. This must have killed many larvæ, I should imagine, unless their instinct forewarned them of the approaching cold, and they concealed themselves. No doubt in exposed districts and situations they mostly suffered.—T. B. JEFFERYS; Clevedon. [It would be interesting to actually know whether summer frosts do kill lepidopterous larvæ. Those species which hibernate as larvæ are none the worse for being frozen hard and stiff for weeks; but

whether such species have through heredity attained that faculty, while those which are larvæ in summer suffer death from frost, is a fact which has, probably, never been cleared up.—J. T. C.]

LEPIDOPTERA OF SOUTH BUCKINGHAMSHIRE.—In April, 1887 (Entom. xx. 89), I recorded the actual captures of Macro-lepidoptera made by me during the season of 1886 at Chalfont St. Peter. I am now able to give the result of my efforts in the same locality during the following season of 1887, though my hours of hunting were limited. Wishing to complete the list, so far as I am personally concerned, I only state my actual captures, arranged in the same way as in my last contribution, omitting all species there recorded. Besides those I give in the following list, I came upon one specimen of *Tephrosia luridata*, which I unfortunately lost; and on the ledge of a small hut in a wood I found, in a small heap, enough wings of *Stauropus fagi* to make two perfect insects, which had evidently been destroyed by our entomological enemies, the bats. January.—Caught: *Hybernia rupicaprararia* (3). March.—Caught: At willows, *Taniocampa pulverulenta* (5), *T. gothica*, *T. stabilis* (common); at sugar, *Scoposoma satellitia* (2). April.—Caught: *Anticlea badiata* (4), *Hybernia marginaria*, *Xylocampa areola* (2); at willows, *Taniocampa pulverulenta* (6), *T. gothica* (5), *T. stabilis* (common); at sugar, *Pachnobia rubricosa*. May.—Caught: *Euchloë cardamines* (several), *Pieris rapæ* (common), *P. napi* (3), *Gonepteryx rhamni*, *Argynnis euphrosyne* (4), *Odontopera bidentata*, *Drepana falcatoria* v. *pallida*, *Melanippe sociata* (2), *Panagra petrararia* (common); at rest, *Heptalus lupulinus*, *Spilosoma mendica* (female). June.—Caught: *Polyommatus phlæas* (3), *Argynnis euphrosyne* (common), *A. selene*, *Pieris brassicæ* (common), *P. rapæ* (common), *P. napi* (common), *Euchloë cardamines* (common), *Melanippe sociata* (8), *Thera variata* (common), *Syrichthus malacæ*, *Cidaria truncata* v. *perfuscata* (4), *C. corylata*, *Emmelesia affinitata*, *Eupithecia exigua* (3), *E. castigata*, *Strenia clathrata*, *Cænonympha pamphilus* (common), *Panagra petrararia* (common), *Lomaspilis marginata* (3), *Eurymene dolobraria* (2), *Bapta binaculata*, *Macaria liturata* (2), *Euclidia mi*, *Heptalus lupulinus* (abundant), *Spilosoma mendica* (2 females), *Cilix glaucata* (2), *Drepana falcatoria* and v. *pallida* (7), *Hylophila prasinana* (6), *Euchelia jacobææ* (common), *Agrotis urticæ*; at rest, *Dasychira pudibunda* (2), *Tephrosia crepuscularia* (3). July.—Caught: *Uropteryx sambucaria* (3), *Bapta binaculata*, *Cidaria picata*, *Thyatira batis*. August.—Caught: *Thecla quercus* (abundant), *Polyommatus phlæas*, *Gonepteryx rhamni*, *Acidalia bisetata* (3), *Cidaria corylata*, *C. immanata*, *Eubolia bipunctaria*, *Diantheicia carpophaga*, *D. capsicola*; at light, *Strenia clathrata*, *Melanthia ocellata*, *Luperina testacea* (common), *Cerigo matura*, *Eupithecia absynthiata* (2), *Charaxes graminis* (3), *Calymnia affinis*; at sugar, *Noctua castanea*; at rest, *Sphinx convolvuli*, *Cirrhælia xerampelina* (21). September.—At rest: *Cirrhædia xerampelina* (8). I was away the greater part of July, and throughout the season "sugar" was almost a failure, the opposite of the previous year.—(Rev.) J. SEYMOUR ST. JOHN; 42, Castlewood Road, Stamford Hill, N., March, 1889.

SUGAR VERSUS BLOSSOMS IN NEW ZEALAND.—Much has been written at various times on the futility of sugaring in the neighbourhood of blossoms, but I think that this axiom should be taken in a far more limited sense than is usually the case. On the evening of February 8th I was collecting in the Botanical Gardens here, the white rata (*Metrosideros*

scandens) being in full bloom at the time, and attracting large numbers of Lepidoptera. I however determined, by way of experiment, to try sugaring in a small wooded gully, less than quarter of a mile distant from the blossoms, and was rewarded by taking a good series of several Noctuæ and Geometræ at the sugar. I should also mention, while on this subject, that I always use rum and honey, which gives out a much more powerful odour than the ordinary sugar: I also apply the mixture at least fifteen minutes after sunset, which I think is a matter of some importance as the bait does not have time to lose its attractive scent before the moths begin to fly.—G. V. HUDSON; Wellington, New Zealand, March 19, 1889.

AUSTRALIAN LEPIDOPTERA.—We hear that the publication of the fine illustrated work on the life-histories of Australian Lepidoptera, of which three parts were published by the late Mr. A. Scott, under the title, 'Australian Lepidoptera and their Transformations,' is to be continued by the Trustees of the Australian Museum, Sydney. The work of editing the valuable material left by Mr. Scott, and of revising the classification and nomenclature of the species, has been entrusted to his daughter Mrs. Edward Forrde and Mr. Sidney Olliff.—Ed.

COLEOPTERA NEAR BIRMINGHAM.—At a recent meeting of the Birmingham Entomological Society, Mr. W. G. Blatch made some interesting remarks on an extraordinary find of Coleoptera near Knowle. On a mossy bank facing the north, about two by three yards, he has taken during a few short visits in March and April, 145 species, including *Amara nitida*, Sturm., *Homalota atomaria*, and many other very rare species. He believes the bank is by no means exhausted yet. The remarks were illustrated by the beetles themselves.—C. J. WAINWRIGHT, Hon. Sec., Birmingham Entom. Soc., April, 1889.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—May 1st, 1889.—Mr. F. Du Cane Godman, M.A., F.R.S., Vice-President, in the chair. Mr. Walter F. H. Blandford, B.A., of Trinity College, Cambridge, and 48, Wimpole Street, W., and Mr. John W. Downing, of 59, Lupus Street, St. George's Square, S.W., were elected Fellows. Mr. W. L. Distant announced the death of Dr. Signoret of Paris, one of the Honorary Fellows of the Society. Dr. Sharp exhibited male and female specimens of an abnormal form of *Rhomborhina japonica*, found in Japan by Mr. G. Lewis. They exhibited a contraction of the thorax, which was much narrower than usual at the base, so that the mesothoracic epimera were entirely exposed. Dr. Sharp also exhibited a small collection of Coleoptera made by Dr. N. Manders in the Shan states, Upper Burmah; this collection contained several new interesting forms, the most remarkable being a small Heteromermous insect bearing a considerable resemblance to *Rhysodes*. Amongst the specimens was an example of *Batocera roylei*, which he had retained in a relaxed condition, so that the Fellows might have an opportunity of hearing its stridulation; this was produced in a very audible manner by passing the base of the prothorax backwards and forwards over a striated space at the base of the scutellum. Mr. C. O. Waterhouse exhibited, for Mr. Frohawk, a series of wings of British Butterflies, prepared in accordance with a process (described by Mr. Waterhouse in the Proc. Ent. Soc.

1887, p. xxiii), by which they were denuded of their scales so as to expose the neurulation. Dr. P. B. Mason exhibited cocoons of a species of spider, — *Theridion pallens*, Black., — from Cannock Chase, distinguished by the presence of large blunt processes on their surface. Mr. H. Goss exhibited, for Mr. N. F. Dobrée, a number of galls of *Coccidæ*, picked off trees of *Acacia melanoxylon* and *Grevillea robusta* growing in the Market Square, Natal. These galls had been referred to Mr. J. W. Douglas, who expressed an opinion that they belonged to the Fam. *Brachyscelidæ*, and probably to the genus *Brachyscelis*, Schrader. He said that most of the species lived on *Eucalyptus*. Captain H. J. Elwes exhibited a long and varied series of *Terias hecabe*. He remarked that all the specimens which had strongly defined chocolate markings were taken in the cold and dry season, and that those which were without, or almost without, markings, were taken in the hot and wet season. Captain Elwes further observed that he believed that many specimens which had been described as distinct were merely seasonal forms of this variable species. Mr. W. L. Distant, Mr. F. D. Godman, Prof. Meldola, Mr. H. T. Stainton, and Mr. G. Lewis took part in the discussion which ensued. Mr. W. Dannatt exhibited specimens of *Thaumantis howqua*, West, from Shanghai. Mr. H. Burns exhibited, and made remarks on, a number of nests of living ants of the following species, viz., *Formica fusca*, *Lasius alienus*, *L. flavus*, *L. niger*, *Myrmica scabrinodis*, &c. One of the nests contained a queen of *L. flavus* which had been in the exhibitor's possession since September, 1882. Mr. G. C. Bignell communicated a paper entitled "Description of a new species of British Ichneumonidæ." Mr. A. G. Butler communicated a paper entitled "A few words in reply to Mr. Elwes' statements respecting the incorporation of the Zeller Collection with the General Collection of Lepidoptera in the Natural History Museum." Capt. Elwes, Mr. Stainton, Mr. Godman and others took part in the discussion which ensued. — H. Goss and W. W. FOWLER, *Joint Hon. Secs.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY. — April 25th, 1889. — T. R. Billups, F.E.S., President, in the chair. Messrs. W. Cant, of Regent's Park, and R. Fortune, of Harrogate, were elected members. Mr. Cooper exhibited a series of *Taniocampa populeti*, bred from a specimen said to have been taken at Rannoch. Mr. Tugwell said that the specimens did not differ from the southern form of the species, and Mr. Carrington remarked that the same form was taken in Yorkshire. Mr. Adye showed a long series of *Asphalia ridens*, from the New Forest. Mr. Fremlin, varieties of *Vanessa urtica*, picked from 3500 specimens bred by him last season; in some of the specimens the variation was in the shade of colour of the wings, in others in the size of the two spots on the superior wings and in the duplication of the spots, and in many in the absence of the pigment. These last Mr. Fremlin said emerged with crumpled wings, and died within a few hours of doing so. There were also several varieties of *Vanessa io* in Mr. Fremlin's exhibit. Mr. W. West (Greenwich) exhibited the specimen of *Carpocapsa pomonella*, referred to in Mr. Cockerell's note, read at the previous meeting. Mr. T. R. Billups, a large number of British spiders, mounted on card, and he stated that he had very little difficulty in pressing them in this way. Mr. Wilkinson, an example of *Nephula inaurata*, from the Seychelle Islands, but expressed some doubt as to whether the insect was properly named. Mr. Carrington contributed a paper, "British Spiders," which was followed by a discussion.

May 9th.—The President in the chair. Mr. Tugwell exhibited *Tep. biundularia*, showing marked variation, including a banded male, all from a specimen taken at Tilgate Forest, May, 1888: also bred ser. *T. crepuscularia*, spring and summer broods, from the same locality. Adye, a light form of *Catocala promissa*, the dark band on the hind being very indistinct. Mr. Moore, two larvæ of a species of *Sphinx*, the West Indies. Mr. Adkin, a short series of *Nyssia hispidaria*, from New Forest, and remarked that it had been fairly common in the E. Mr. Watson also exhibited *N. hispidaria*, from West Wickham. Mr. exhibited a long series of *Noctua brunnea* and *N. dahlia*, *N. festiva* and *conflua*, from various localities, and remarked that in 1886 and 1887 obtained large numbers of the larvæ of *N. brunnea* from North I. which were found feeding on bilberry and a species of wood-rush; all the larvæ differed in colour very considerably, yet they were very close in the markings. He then at some length pointed out the different degrees of variation of *brunnea* in his exhibit, and said that in some cases *brunnea* closely approached *dahlia* that he had a difficulty in saying which was which; and he was of opinion that the relationship between *brunnea* and *dahlia* was something similar to that between *festiva* and *conflua*. Mr. also exhibited two drawers from his collection, containing the series referred to; and Mr. Adkin, *N. brunnea* and *N. dahlia*, from Sligo, and other localities. A discussion ensued, Messrs. Tutt, Adkin, Mr. Carrington, and others taking part. Mr. Billups exhibited a series of *Bembidium testaceum*, from Chobham; living specimens of *Carabus* all captured in the Borough Market; and a species of Oribatidæ, which was stated was causing an immense amount of mischief to corn-chandlers feeding on the crushed oats.—H. W. BARKER, *Hon. Sec.*

REVIEW.

Australian Butterflies. By A. SIDNEY OLLIFF, F.E.S., &c. Sydney: Batson & Co. 1889.

Mr. Olliff, whom it will be remembered left this country to take up his position in the Zoological Department of the Australian Museum, Sydney, some time ago communicated to the columns of the 'Sydney Mail' newspaper, a series of popular articles upon the Rhopalocera of that region. These articles have been collected, enlarged, and printed, at the request of the Natural History Society of New South Wales, in book form; the first chapter upon collecting and preserving insects generally. The work, which was in the newspaper and now under notice, is extensively illustrated by cuts of drawings by Mr. J. M. Cantle. The evident object is to popularize the study of Rhopalocera in Australia, and we can hardly imagine that the Olliff's little work will fail in its intention. There is no systematic arrangement of the book of the species inhabiting Australia, which would have been an advantage, but we gather that material is still wanted for such. On looking through the families there appears to be mentioned nearly 300 species now known, to which number others will doubtless be added from time to time. In point of numbers the Lycenidæ stand first with about 100 species, next Hesperidæ about seventy species, Pierinæ about fifty, Nyctelinæ twenty-five, Papilionidæ twenty; the remainder being spread over many families and genera in small numbers.—J. T. C.

THE ENTOMOLOGIST.

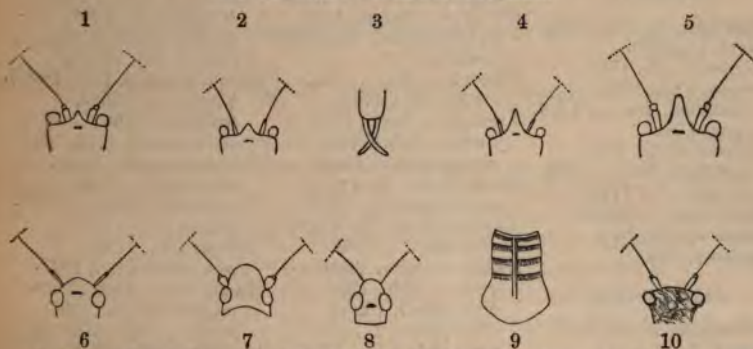
Vol. XXII.]

JULY, 1889.

[No. 314.]

BRITISH ORTHOPTERA.

By EDWARD INGLEBY MILLER.



1, head of *Odontura punctatissima*; 2, head of *Meconema varia*; 3, apex of abdomen of *Meconema varia*, ♂; 4, head of *Xiphidium dorsale*; 5, head of *Phasgonura viridissima*; 6, head of *Thamnotrizon cinereus*; 7, head of *Decticus brevipennis*; 8, head of *Stenobothrus parallelus*: all twice magnified. 9, pronotum of *Locusta peregrina*, natural size. 10, head of *Edipoda caerulea*, twice magnified.

Few of our British insects have been so much neglected as the Orthoptera, no work having been published since 'British Entomology,' by Curtis (1824—39), and 'Illustrations of British Entomology,' by Stephens (1828—36); this is the more remarkable, as they are both large and handsome, besides being easily preserved and retaining their colours fairly with the exception of the green on many species. The larvæ and pupæ strongly resemble the perfect insects, the latter only having the rudiments of wings, and the former none at all.

Many of these large and beautiful insects are found abundantly in dry meadows, pastures, grassy places, &c., during summer and autumn, where they may be caught in large numbers with a net; some occur upon trees (these latter having long antennæ),

and others in boggy places. They may be killed with carbon disulphide or potassium cyanide, after which they should be pinned through the thorax and set.

There is great confusion in the nomenclature of the families, different authors applying the name Gryllidæ to each of the families composing the Saltatoria, while the term Locustidæ is by some used for those grasshoppers with long antennæ, by others for those with short antennæ; in order to avoid the confusion as much as possible, I have called the first family Achetidæ, and the other two respectively Gryllidæ and Acrididæ.

The most useful works on Orthoptera (besides the two mentioned above) are Fischer's 'Orthoptera Europæa' and Brunner von Wattenwyl's 'Prodromus der Europäischen Orthopteren' (both written in Latin and German).

LIST OF BRITISH ORTHOPTERA.

CURSORIA.	
Blattidæ , Steph., 1829.	Gryllidæ , Steph., 1829.
BLATTA , L., 1766.	ODONTURA, Ramb., 1838.
<i>lapponica</i> , L., 1745.	<i>punctatissima</i> , Bsc., 1792.
<i>livida</i> , Fab., 1793.	<i>standishii</i> .
<i>ericetorum</i> , Wesm., 1838.	MECONEMA, Serv., 1831.
<i>nigripes</i> , St.	<i>varia</i> , Fab., 1793.
<i>germanica</i> , L., 1766.	XIPHIIDUM, Serv., 1831.
PERIPLANETA , Burm., 1839.	<i>fuscum</i> , Fab., 1793.
<i>orientalis</i> , L., 1745.	<i>dorsale</i> , Latr., 1804.
<i>americana</i> , L., 1766.	PHASGONURA, Westw.
PANCHLOBA , Burm.	<i>viridissima</i> , L., 1758.
<i>madera</i> , Fab.	THAMNOTRIZON, Fsch., 1853.
	<i>cinereus</i> , L., 1789.
	DECTICUS, Serv., 1831.
	<i>griseus</i> , Fab., 1793.
	<i>brevipennis</i> , Charp.
	<i>brachyterus</i> , L., 1745.
	<i>verrucivorus</i> , L., 1761.
	Acrididæ.
	STENOBOTHRUS, Fisch.
	(Rhammatocerus, Fisch.)
	<i>elegans</i> , Charp., 1825.
	<i>parallelus</i> , Zett., 1821.
	<i>lineatus</i> , Panz., 1796.
	<i>viridulus</i> , L., 1761.
	<i>bicolor</i> , Charp., 1825.
	<i>rufipes</i> , Zett., 1821.
	(Gomphocerus, Thb., 1815)
	<i>biguttatus</i> , Charp.
	<i>rufus</i> , L., 1766.
	<i>sibiricus</i> , L., 1766.
	STETHEOPHYMA, Fisch.
	<i>grossum</i> , L., 1766.
	PEZOTETRIX, Burm., 1839.
	<i>pedestris</i> , L., 1761.
	LOCUSTA, L., 1748.
	<i>peregrina</i> , Oliv., 1807.
	PACHYTILUS, Fieb., 1852.
	<i>migratorius</i> , L., 1793.
	<i>flavipes</i> , Don. (Gmel.).
	<i>stridulus</i> , L., 1761.
	CEPIDOPA, Burm., 1825.
	<i>ceruleus</i> , L., 1764.
	TETRIX, Charp., 1841.
	<i>subulata</i> , L., 1761.
	<i>bipunctata</i> , L., 1761.

TABLE OF FAMILIES.

I. Legs formed for running (Cursoria)	-	-	-	-	-	BLATTIDÆ.
II. Legs formed for jumping (Saltatoria).						
1. Antennæ long.						
A. Elytra horizontal when in repose	-	-	-	-	-	ACHETIDÆ.
B. Elytra deflected when in repose	-	-	-	-	-	GRYLLIDÆ.
2. Antennæ short	-	-	-	-	-	ACRIDIDÆ.

BLATTIDÆ, Steph., 1829.

= Order DICTYOPTERA, Leach.

Eight species. Nocturnal, omnivorous insects, easily distinguished from the other families by their inability to jump and the rapidity of their movements; the larger species (of which our common cockroach is a familiar example) have been

introduced from foreign countries, and are usually found in dwellings, warehouses, &c.; while the smaller species (*Blatta*) occur in woods, under stones, amongst heath, rushes, &c. The eggs are laid all at once enclosed in a capsule.

TABLE OF GENERA.

I. Species smaller	-	-	-	-	BLATTA.
II. Species larger.					
1. Antennæ long	-	-	-	-	PERIPLANETA.
2. Antennæ short	-	-	-	-	PANCHLORA.

1. BLATTA, L., 1766.

= ECTOBIA, Westw., 1840.

These insects differ from *Periplaneta* and *Panchlora* by their smaller size; they occur on herbage, beneath stones, under the bark of trees, &c.; several of the species may be caught by sweeping.

I. Legs yellowish.

1. Species larger. Two distinct dark marks on thorax - *germanica*.
 2. Species smaller - *livida*.

II. Legs brown or blackish.

1. Species larger. One distinct dark mark on thorax - *lapponica*.
 2. Species smaller.
 a. First joint of hind tarsi pale - *ericetorum*.
 b. Base only of first joint of hind tarsi pale - *nigripes*.

1. *B. lapponica*, L., 1745. = *nigro-fusca*, De Geer; *sylvestris*, Scop.; *hemiptera*, Fab.—Figures of this species will be found in Curtis's 'British Entomology,' xii. 556; Donovan's 'British Insects,' x. pl. 332; and Staveley's 'British Insects,' pl. iv. fig. 2. Very like *B. ericetorum* and *nigripes*, but larger, and with a distinct, well-defined dark mark on the thorax. Occurs in woods in the South of England from May to July. Rare.

2. *B. livida*, Fab., 1793. = *pallida*, Oliv.—Comparatively shorter and broader than the other species, with the disk of the thorax scarcely, if at all, darker than the ground colour. Found under the bark of trees and beneath stones in the South of England during June and July.

3. *B. ericetorum*, Wesm., 1838. = *germanica*, Panz.; *panzeri*, Hag., Steph.—Strongly resembles *B. nigripes*, but easily distinguished by the colour of the first tarsal joint. Occurs among heath, under stones, in woods, &c., near the coast, and is not uncommon in the South of England from June to August.

4. *B. nigripes*, St. = *ericetorum*, var. ?.—Rather larger and of a more mottled appearance than *B. ericetorum*, of which it is perhaps a variety. Occurs in woods during June.

5. *B. germanica*, L., 1766. = *asiatica*, Pallas.—Figures of this insect will be found in Donovan's 'British Insects,' x. pl. 341; and in Kirby & Spence's 'Introduction to Entomology,' 5th ed. i. pl. ii. fig. 3. Our largest species; easily distinguished

by the two distinct dark marks on the thorax; it is a rare insect, but occurs in various parts of London and other towns with foreign trade, but is always very local, inhabiting particular houses. It is a native of Asia and the east of Europe.

2. PERIPLANETA, Burm., 1839.

= BLATTA, L.; KAKERLAC, Latr.; STELEOPYGA, Fisch.

Easily distinguished from *Panchlora* by the long antennæ.

- I. ♂. Elytra shorter than abdomen. ♀. Elytra very small *orientalis*
 II. Elytra as long or longer than the abdomen in both sexes *american*

1. *P. orientalis*, L., 1745. = *culinaris*, DeGeer. — Not native of this country, having been introduced from India; it is the common cockroach, so abundant in our houses; also occurring out-of-doors.

2. *P. americana*, L., 1766. — This species is figured in Cuvier's 'Regne Animal,' pl. 77, fig. 4. Larger and handsomer than *P. orientalis*. Very local, but occasionally found in London and other places, where it has been introduced from abroad; it is well-established in many houses, and appears to be gradually spreading.

3. PANCHLORA, Burm.

= BLABERUS, L.?

1. *P. maderæ*, Fab., is the largest of our Blattidæ; it has been occasionally found in London, having been introduced from its native place (Madeira), but is not so well established as *P. orientalis* and *P. americana*.

ACHETIDÆ, Leach, 1817.

= GRYLLIDÆ, Latr.; GRYLLUS-ACHETA, L.; ACHETA, Fab.

Four species. Nocturnal, burrowing insects, easily distinguished from the Gryllidæ and Acrididæ by the horizontal position of the elytra when at rest, and (with the exception of *Nemobius*) the great length of the wings, which are longer than the elytra; they stridulate by rubbing the base of one elytron upon the other. Found in woods, gardens, &c.; one species (*A. domesticus*) occurring in houses.

TABLE OF GENERA.

- I. Elytra much shorter than abdomen.
 1. Very large - - - - - GRYLLOTALPA.
 2. Small - - - - - NEMOBIUS.
 II. Elytra as long as abdomen - - - - - ACHETA.

1. GRYLLOTALPA, Latr., 1807.

= GRYLLUS (ACHETA), L.

1. *G. vulgaris*, Latr., 1807. = *Gryllotalpa*, L. — Figures of this species will be found in Curtis's 'British Entomology,' 456; Donovan's 'British Insects,' v. pl. 147; Cuvier's 'Regne Animal,' pl. 81, fig. 1; &c. This remarkable insect cannot

confounded with any other, its large size and enormously thick anterior legs distinguishing it at once. Not uncommon in many localities, especially in the South-west of England; it frequents damp places, occurring from April to June, and may be caught by inserting a stem of grass into its burrow, which (being extremely ferocious) it will seize, and can then be pulled out, as it will not leave loose; *A. campestris* can also be captured in this manner.

2. ACHETA, Fab.

= GRYLUS, L.

The insects in this genus may be distinguished from the other Achetidæ by their elytra being as long as the abdomen; they can also be recognised by their size, which is much smaller than *Gryllotalpa*, and much larger than *Nemobius*.

I. Colour blackish - - - *campestris*.

II. Colour brown - - - *domestica*.

1. *A. campestris*, L., 1764.—This species is figured in Cuvier's 'Regne Animal,' pl. 81, fig. 3. A rare carnivorous insect, haunting hot sandy places; it burrows to the depth of from six to twelve inches; it occurs chiefly in the South-west of England during May, June, and July, and the male chirps very loudly both day and night.

2. *A. domestica*, L., 1758. — Figured in Curtis's 'British Entomology,' vii. 293; Staveley's 'British Insects'; and Cuvier's 'Animal Kingdom' (Griffith), xv. pl. 130, fig. 2. Narrower than *A. campestris*. This is the well-known cricket so often heard in our houses.

3. NEMOBIUS, Serv., 1839.

= ACHETA, Curtis.

1. *N. sylvestris*, Fab., 1793.—The smallest of our Achetidæ; it is a very rare southern insect, occurring in woods during August and September.

GRYLLIDÆ, Steph., 1829.

= GRYLUS-TETTIGONIA, L.; LOCUSTA, Fab.; LOCUSTARIE, Latr.

Ten species. Diurnal insects; distinguished from the Acrididæ by their long antennæ, and by the females having a long exserted ovipositor; they stridulate by rubbing the elytra together. Found in fields, hedges, and upon trees; many species are very local. These insects should not be placed together in confinement, as many of them are very pugnacious, and will kill and devour one another.

TABLE OF GENERA.

I. Elytra very short, less than half the length of abdomen.

1. Thorax short - - - - - ODONTURA.

2. Thorax very long - - - - - THAMNOTRIZON.

- II. Elytra more than half as long, but not longer than abdomen.
 1. Antennae about twice as long as rest of insect XIPHIDIUM
 2. Antennae not much longer than rest of insect DECTICUS
 III. Elytra longer than abdomen.
 1. Species smaller.
 a. Elytra brownish - - - - - XIPHIDIUM
 a. Elytra green - - - - - MECONEMA
 2. Species larger.
 a. Front of head (seen from above) rounded.
 Eyes not prominent - - - - - DECTICUS
 a. Front of head (seen from above) produced
 into a blunt point. Eyes prominent - PHASGONURA

1. ODONTURA, Ramb., 1838.

= BARBITISTES, Charp.; EPHIPPIGER, Latr.; LEPTOPHYTES, Fie

Differs from all the other Gryllidae except *Thamnotri* its short elytra.

- I. Elytra brown - - - - - *standishii*.
 II. Elytra partly green - - - - - *punctatissima*.

1. *O. punctatissima*, Bosc., 1792. = *autumnalis*, Hag. *scens*, Steph.—This insect is green when living, but soon to brown after death. Not uncommon; usually found upon foliage of bushes and trees during August and September. 1

2. *O. standishii*.—I am unable to obtain any information this species, which differs from *O. punctatissima* in the of the elytra.

2. MECONEMA, Serv., 1831.

1. *M. varia*, Fab., 1793. = *thalassima*, DeGeer; Stoll.; *viridissimus minor*, St.; *arboreus*, Fuessly.—This beetle insect is figured in Donovan's 'British Insects,' iii. pl. 79, Very common on the foliage of lime and oak trees, feeding the leaves; it occurs during August and September, and is caught by beating the branches. This species does not hibernate. Figs. 2 and 3.

3. XIPHIDIUM, Serv., 1831.

= LOCUSTA, Fab.

- I. Elytra longer than the abdomen - - - - - *fuscum*.
 II. Elytra shorter than the abdomen - - - - - *dorsale*.

1. *X. fuscum*, Fab., 1793.—Figured by Panzer, 33, 1 This species may be looked for upon herbage and the leaf trees in damp places; ? indigenous.

2. *X. dorsale*, Latr., 1804. = *dorsalum*, H.-Schæff.; Zett.—Not uncommon in some localities, occurring in places during July and August. Fig. 4.

4. PHASGONURA, Westw.

= LOCUSTA, DeGeer, Wat.

1. *P. viridissima*, L., 1758.—This species is figured in Cuvier's 'Animal,' pl. 82, fig. 3; and Donovan figures the

and eggs as well as the imago. Easily distinguished by its large size and long unspotted green elytra; it is usually found on trees and bushes, and is not uncommon in many localities during August and September. Omnivorous. Collectors should be careful not to allow this species to bite them (as it will certainly do if they put their fingers too near); it will, however, be an interesting experiment for any one seeking information. This insect is said to be excellent when boiled in water for half-an-hour (having thrown away the head, wings, and legs), then sprinkled with salt and pepper and fried, adding a little butter. Fig. 5.

5. THAMNOTRIZON, Fisch., 1853.

= MICROPTERYX, Steph.; ANISOPTERA, Serv.

1. *T. cinereus*, L., 1789. = *griseo-aptera*, DeGeer; *aptera*, Charp.; *clypeata*, Panz.—Resembles *Odontura* in having extremely short elytra, but may be distinguished from it by the very long thorax; it should be looked for among herbage during September. The males are much rarer than the females. Fig. 6.

6. DECTICUS, Serv., 1831.

= ACRIDA, Curtis.

I. Elytra much longer than the abdomen.

- | | | | | | | | |
|----------------------|---|---|---|---|---|---|-----------------------|
| 1. Colour grey-brown | : | - | - | - | - | - | <i>griseus</i> . |
| 2. Colour green | : | - | - | - | - | - | <i>verrucivorus</i> . |

II. Elytra not longer than the abdomen.

- | | | | | | | | |
|---|---|---|---|---|---|---|-----------------------|
| 1. Thorax with a distinct pale mark on the side; | | | | | | | |
| elytra without any green | : | - | - | - | - | - | <i>brevipennis</i> . |
| 2. Thorax with an indistinct pale mark on the side; | | | | | | | |
| elytra usually partly green | : | - | - | - | - | - | <i>brachypterus</i> . |

1. *D. griseus*, Fab., 1793. = *denticulata*, Panz.; *falcata*, Zett.; *intermedius*, Serv., var.; *krynichii*, Fisch., var.—Very local and rare, preferring chalky maritime districts; it occurs from July to September.

2. *D. brevipennis*, Charp.—Found amongst herbage, &c., in July and August. Local, but not uncommon. Fig. 7.

3. *D. brachypterus*, L., 1745. = *kirbii*, Dale.—In this species the ovipositor is more than half the length of the abdomen, whereas in *D. brevipennis* it is less. Occurs on herbage from July to September.

4. *D. verrucivorus*, L., 1761. = *binglei*, Curt.—This insect is figured in Curtis's 'British Entomology,' ii. 82. Rare and very local; it occurs during August and September, usually amongst grass near the sea-coast. The Swedish peasants are said to make this insect bite the warts on their hands in order to cure them. *D. verrucivorus* can be distinguished from *Phasgonura* by its more robust form, spotted elytra, and the curved ovipositor of the female (which in *Phasgonura* is nearly straight).

Dulwich Village, S.E., May, 1889.

(To be concluded.)

ON THE VARIATION OF INSECTS.

By T. D. A. COCKERELL.

(Continued from p. 149.)

CLASS III.—VARIETIES OF SIZE.

Colias edusa major, expanse 57 mill.; *C. edusa minor*, exp. 32 mill. (Entom. xi. 51). *Samia cecropia*, wing-expanse varies from $4\frac{1}{8}$ to $7\frac{1}{2}$ inches (Worthington, Can. Entom. 1876, 166). *Lycæna corydon minor*, confined to one spot near Lewes (A. W. Gush, Entom. xx. 265). *Lycæna icarus minor*, exp. less than 20 mill. (Sabine, Entom. xx. 287). *Spilochalcis maria*, Riley, female, varies from 4 to 8 mill. in length, and the male from $3\frac{1}{2}$ to 6 mill., while *Chalcis ovata*, Say, varies from 6 to 8 mill. long (L. O. Howard, Bull 5, U. S. Dept. of Agr. Bureau of Entom. 1885). *Euchloë cardamines minor*, "about half normal size in both sexes" (Ent. Mo. Mag. 1888, 81).—We find that when insects vary in size it is more commonly the case that they become smaller than larger,—that is to say, the influences which act upon the size of an insect are more powerful or more frequent in the direction of dwarfing than in that of adding to the normal growth. The reason of this can be understood if we consider what are the factors in this matter; they are probably three, *nutrition* (quality or amount of food), *length of the period of development*, and *power of assimilation*.

Guyot Daubès, in an admirable paper on "Variations in Human Stature" (translated in 'Popular Science Monthly,' July, 1887), has laid down a general law, which seems also largely applicable to insects. He argues that nutrition is the main thing affecting human stature. In high latitudes the power of assimilation is great, but the food-supply scanty, and this gives rise to a dwarfed race. On the other hand, in hot climates the food-supply may be abundant, but the power of assimilation small and this again dwarfs stature. But in temperate climates there is a good supply of food, and the conditions are favourable for assimilation; and here we get the maximum of stature. It is to be remembered, though, that recent investigations have shown that tall and dwarf races dwell side by side in equatorial Africa, and I do not know whether the reason of this has been satisfactorily explained.

Now, generally speaking, the power of assimilation, at least of herbivorous insects, is taxed to the utmost: they have all they can eat, and they eat all they can digest; but on the other hand, if the food-supply falls short or dries up, they possess great powers of vitality, and manage to reach the imago stage in the form of dwarfs. This, I think, will explain why we see more dwarfs than giants among Lepidoptera. It will sometimes happen

that, owing to some peculiarities of the season, the number of dwarfed forms observed is unusually great. In 1887 this seems to have been the case in England, and Mr. J. T. Williams (Entom. xx. 288) attributed it, no doubt correctly, to the dryness of the atmosphere and consequent partial drying-up of the food-plants. This is dwarfing due to the *inferior condition* of the food, but in other cases the *quantity* of it has to be considered. Mr. John T. Carrington (*in litt.*) gives a good illustration of this; he writes:—"Some few *Nyssia hispidaria* have been taken in Richmond Park this spring of 1889, but I hear they are small, and so are the *Hybernia leucophæaria*. Last year there was a great plague of larvæ of *Tortrix viridana*, which ate off nearly all the leaves from the oaks, which may account for the small specimens of these two species."

Lepidoptera may be dwarfed in captivity, by giving the larvæ an insufficient supply of food, and it has been stated that these dwarfs are generally of the male sex. Mr. T. G. Gentry (Can. Ent. 1877, 50) believed he could influence the sex of insects in this way, and out of twenty *Samia cecropia* so reared eighteen proved to be males. It would be interesting if all those who possess dwarfed Lepidoptera would examine them and report on the sex.

Some species, as the Chalcididæ quoted above, and species of *Lycæna*, vary much in size when apparently under the same conditions. Mr. W. H. Edwards (Can. Ent. 1876, 203), writing of *Lycæna comyntas*, says:—"I believe that wherever *comyntas* is found, two sizes of the butterfly appear, one scarcely more than half the superficial area of the other. I do not know of any other species in which this peculiarity is regularly found." Mr. J. W. Tutt (Entom. xx. 323) relates that small *Lycæna corydon* occur every year at Dover, and he has found very small *L. icarus* flying together with those of normal size. But here he offers an intelligible explanation, that the dwarfs are those which have been reared on isolated food-plants which were insufficient for their needs.

In insects which have more than one brood in the year, the small size of many vernal broods is quite well known. Presumably this has to do with the length of the period of development, and I have dealt with this subject under "*Seasonal forms*" on pages 27, 28. A curious instance, falling under this head, is given by Mr. C. G. Barrett (Ent. Mo. Mag. 1888, 81) in connection with *Euchloë cardamines* at Haslemere. There occurred a variety about half the normal size, in both sexes, and the males of this variety were invariably the earliest specimens seen, the normal males appearing two or three days later.

Geographical variation in size has been much discussed. Prof. Baird pointed out that birds and mammals tend to decrease

in size southward, and Dr. J. A. Allen has shown that in the eggs of the same species of birds, those in the south are less in number and of smaller size than in the north. Insects, on the other hand, frequently, though not invariably,* increase in size to the southward. These differences appear somewhat anomalous, but remembering that in the Vertebrata an increase of temperature may impair the power of assimilation, while it is not likely to affect insects in this way, at any rate to so great an extent, it is possible to see why size-variation should apparently not follow precisely the same lines in these different classes of animals. Prof. A. S. Packard (Mon. Geom. Moths, pp. 588, 589) has shown that, in North America, Lepidoptera increase in size westward, and this he attributes to the warmer and more humid climate of the Pacific slope. *Drasteria erectea*, a common North-American moth, appears to reach its maximum size in California and its minimum in the Hudson's Bay Territory (see Fourth Rept. U. S. Ent. Com. 1885, p. 352). A. R. Grote (Can. Ent. xii. 17) mentions examples of *Crambus vulgivagellus* and *C. topiarius* from the west which were smaller than eastern specimens, but the first was from a rather northerly locality (Vancouver Island), and the second from a mountainous district (Sierra Nevada), so they are really only exceptions proving the rule.

Insects found on small islands are often undersized, and this may easily be due to want of nutriment. Wollaston states that *Anthonomus ater*, Msh., averages two lines long, but none of those collected on Lundy Island exceed one line, while *Ceuthorrhynchus contractus*, Msh., is also small on Lundy. Holme (Trans. Ent. Soc. Lond. ii., pp. 59—62) declares that *Bolitochara assimilis*, Kirby, is invariably smaller in Scilly than near Penzance. But insular faunæ are not always dwarfed, even where one would most expect it. St. Kilda "is very bare, being closely fed down with sheep and cattle, and yet," says Mr. C. V. Dale (Entom. xxii. 13), "I can fully endorse Dr. Sharp's remarks of the specimens [of insects] showing no signs of depauperation." It is worth noting, though, that with these exceptions all the St. Kilda Coleoptera are Geodephaga, and such groups as the Chrysomelidæ and Curculionidæ are (so far as is known) wholly unrepresented. A more curious case is that of the Deserta Grande, one of the Madeira Islands. This island is exceedingly rocky and bare, and I believe closely fed down by rabbits; yet Wollaston records that several species of beetle, such as *Olisthopus maderensis*, Woll., are larger there than on the main island of Madeira.

* For instance, *Vanessa urticae* is said to be larger in Scotland than in England (F. A. Walker, Entom. xx. 301).

CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES
OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.

By J. W. TUTT, F.E.S.

(Continued from p. 157.)

Cerigo, St., *matura*, Hufn.

Thanks to Herr Hoffman, of Hanover, I have been able to get Hufnägel's description of this species from Berlin's 'Magazine,' iii., p. 414. The description is as follows:—" *Phalena matura* (Die Glanzmotte). Anterior wings brownish grey, with white and light yellow markings, which are generally surrounded with brown. Hind wings light yellow, with a broad brown margin." It will at once be seen on looking through a long series of this species, that there are two well-marked extreme forms,—one much marbled with white and red, and with distinct transverse lines and stigmata; the other with these lines and markings very obscured, and the marbling due to the white and red scales almost entirely absent, although these are joined by intermediate forms. Newman, in his 'British Moths,' pp. 295, 296, writes:—"Their colour is various, most commonly bistre-brown of several shades, yet sometimes tinged with brick-dust red, and always having four transverse lines and the two discoidal spots mapped out, or, at least, indicated in pale brown, grey, or white." Guenée, in his 'Noctuelles,' vol. v., p. 179, describes the variegated form under the name of *cytherea*, as also does Fabricius in his 'Entomologia systematica' &c., p. 57, No. 157, where he writes, "*Noctua cristata alis incumbentibus variegatis, striga alba; posticis flavis, margine fusco.*" Hübner figures a striking form in his 'Schmetterlinge,' &c., under the name of *connexa*, with the red colour greatly predominating, while Esper's *texta* (pl. 108, fig. 5) represents the most obscure form of this species. Guenée, in his 'Noctuelles,' vol. v., p. 179, remarks:—"One must breed this species if one wishes to have fine specimens, for so fleeting is the colour, that, even on emergence, it appears as if faded." Taking, therefore, the variegated form as the type, I think it advisable to refer simply to the two forms named by Hübner and Esper.

a. connexa, Hb.—Anterior wings with the base reddish brown to the first transverse basal line; between the first and second basal lines a broad black line from the costa to the inner margin. A pale grey line beyond the reniform, beyond which to the hind margin the colour is blackish grey; a wavy, red transverse line runs from costa to inner margin. Hind wings pale yellow, with brown margin and distinct nervures (Hübner's 'Schmetterlinge,' &c., fig. 548).

β. texta, Esp.—Esper, pl. 108, fig. 5, figures a variety of *matura* under this name, of which the following is the description:—"Male. Anterior wings almost unicolorous, dull purplish brown, with a dark streak

parallel to the costa from base to reniform, and two dull basal lines; no orbicular, but distinct reniform; a dull wavy line parallel to hind margin. Hind wings yellowish, with a dull purplish grey hind margin." Although this description would scarcely apply to any of our specimens of *matura*, there is no doubt that Esper had before him an obscurely-marked specimen of this species. I think this name should, therefore, stand for all specimens of the obscure form.

Luperina, Bdv., *luteago*, Hb.

The type of this species does not occur in Britain, but a melanic form from the Irish coast was described as a distinct species by Mr. Doubleday, under the name of *barrettii*, and has been generally placed in the genus *Dianthecia*. Hübner's fig. 18 represents the type of this species, and may be described as:—"Anterior wings of a pale yellowish colour, median nervure reddish, a reddish transverse basal line with another just within the orbicular; the stigmata very pale; a double transverse line just beyond the reniform, and a wavy reddish line parallel to the hind margin; a dark reddish blotch between the second and third transverse lines (under the stigmata), continued up narrowly outside the reniform, and making another blotch on the costa just outside the reniform; hind margin dotted. Hind wings very pale grey, slightly darker on the hind margin." Hübner's *argillacea* is, according to Dr. Staudinger, a var. of this species, whilst Guenée refers Hb.-Geyer's *olbiena* to this species, and Esper figures another form under the name of "*brunneago*." Of the general variation Guenée writes ('Noctuelles,' vol. v., p. 181):—"It varies in colour from a more or less pure and more or less intense yellow to greyish in some specimens." Of the varieties the British *barrettii* is by far the most striking, and this peculiar form is, I believe, unknown on the Continent. *Barrettii* seems first to have been referred to this species by the late Mr. Buckler, who ('Ent. Mo. Mag.,' vol. xvi., p. 55) writes:—"I am constrained to believe *barrettii* to be an isolated and melanic variety of *luteago*." On the same page Mr. M'Lachlan, in a footnote, writes:—"When last in London, Dr. Staudinger stated to me that, in his opinion, *D. barrettii* is a form of *D. luteago*," and Mr. Dobrée writes:—"My continental specimens of the full-fed larvæ of *luteago* correspond exactly with Mr. Buckler's description of *barrettii* ('Ent. Mo. Mag.,' August, 1879), and anyone who has seen them will recognise that this species has been quite misplaced among the *Dianthæciæ*" (in litt.). "*D. luteago* occurs very rarely in Mecklenburgh, Pomerania, and elsewhere in Central Europe, in Sardinia, Corsica, and is one of the rarest French moths" ('Proceedings of the Royal Irish Academy,' 1884, p. 107).

a. var. *barrettii*, Dbdy.—This variety was first described by Mr. Doubleday, at p. 124 of the 'Entomologist's Annual' for 1864. It is also

fully re-described and figured in Newman's 'British Moths,' pp. 390, 391. There seems to have been a great deal of confusion attending these early specimens, the dark varieties of *conspersa*, since added in tolerably large numbers to our cabinets, having been discovered about the same time, and frequently mistaken for them.

The following remarks on the occurrence of this variety in Ireland are interesting:—" *D. barrettii* is now considered to be a remarkable variety of *D. luteago*, a species which occurs rarely in Central Europe. One object I proposed to myself this summer (1884) was the further investigation of this group, *Dianthæcia*. The occurrence of *D. barrettii* only in one very restricted locality at Howth, while its food-plant flourishes luxuriantly everywhere on the littoral, seemed a remarkable anomaly. I was successful in taking it on the coast of Waterford, and, I believe, the larvæ on the Wicklow shores, but unfortunately an accident killed the pupæ before they hatched out. I have no doubt that the insect occurs elsewhere, but its habits are such as to render it very difficult to capture. The divergence of this insect from its original type is so great as to lead to the inference that a vast period must have elapsed since its isolation from the parent stock." (W. F. de V. Kane, in the 'Proceedings of the Royal Irish Academy,' 1884, p. 107.)

β. var. brunneago, Esp.—Esper, vol. iv., pl. 196, fig. 3, represents the type of this variety. This figure may be described as having:—"Anterior wings dull yellow, with several (eight) short, dark red costal streaks; nervures at base dark reddish, with a single arched basal line of the same colour; directly beyond reniform another transverse waved line, at its centre in contact with lower part of reniform; a narrow streak of dull brownish orange colour along the costa, continued a short distance from the apex down the outer margin; median space (between two transverse lines mentioned) extending from costa to inner margin, also dull brownish orange; stigmata dull grey; a small yellowish patch between and under orbicular and reniform; outer margin below apical patch dull yellow; hind margin with a darker line. Hind wings grey, with dark hind margin." His fig. 3, on the same plate, represents a female which has "more orange tint in ground colour, and two transverse orange bands,—one nearer base than orbicular, one just beyond reniform; a curved series of arches of the same colour parallel to hind margin. Hind wings grey, distinct lunule and transverse line, hind margin orange."

γ. olbiæna, Hb.-Gey.—Geyer's figure 829 is considered by Guenée to represent a form of this species. It may be described as, "Anterior wings of a deep orange colour, with an abbreviated and complete double basal transverse line outlined in reddish; stigmata also outlined in reddish; two double transverse lines beyond the reniform, the outer one wavy." Geyer's fig. 830 is the under side of 829.

δ. var. argillacea, Hb.—According to Dr. Staudinger, Hübner's *argillacea* is a variety of *luteago*. This variety, represented by Hübner's fig. 590, may be described as:—"♂. Anterior wings having the ground colour bright yellow, tinted slightly with orange, and much clouded with grey atoms; the

two transverse basal lines stand out distinctly in the clear ground colour; stigmata clear yellow; a broad shade of the same colour from near the apex to the inner margin; the central area above, below and around the stigmata grey with a greenish tinge, the outer margin of wing also greenish grey with a fine wavy line passing through it parallel to hind margin. Hind wings very dark grey, base paler."

Luperina, Bdv., *dumerilii*, Dup.

Of this very distinct *Luperina* six specimens are supposed to have been captured in Britain; see 'Entomologist,' vol. xviii pp. 73, 74, and Newman's 'British Moths,'* pp. 296, 297. I have seen none of the British specimens, but amongst the continental ones I have looked through there appears to be a great deal of difference in the intensity of the markings. The type has distinct markings and pale stigmata, both males and females, but the females are rather darker than the males. Some specimens are, however, almost unicolorous, although the markings are traceable. Dr. Staudinger treats these dark specimens as Boisduval's *desyllesi*. The following note I made some time ago of the specimens in the continental Doubleday collection at the Bethnal Green Museum:—" *Dumerilii* is very distinct from another species. The females are darker than the males; the males have whitish stigmata, and so has one female; the other two females are more unicolorous, and have the stigmata indistinct."

Var. *desyllesi*, Bdv.—This is treated by Guenée as a distinct species, but Dr. Staudinger treats it as a var. of *dumerilii*, a view I believe now accepted by most continental Lepidopterists. Staudinger says of it "Al. ant. fere unicolor." Guenée, in his 'Noctuelles,' vol. v., p. 183 gives a very complete description. He writes:—"Superior wings of a grey-brown, with the two median lines slender, blackish, margined exteriorly with a fine yellowish line. No claviform stigma (at least in the one I describe from). Ordinary stigmata distinct, of a yellowish white, with a grey-brown centre. Subterminal line of a yellowish white, straight, but continued so as to touch the two edges of the wing. Terminal space not much darker than the ground colour. Inferior wings white in both sexes, with a greyish margin; all four wings white beneath, with an angulated grey line near the outer margin." Guenée mentions, too, only "two examples."

(To be continued.)

SPRING BUTTERFLIES AT HYÈRES.

By FRANK B. NORRIS.

A SHORT list of butterfly captures this spring may prove of interest to some of your readers. The lovely scenery about Hyères and its islands is well known, and contributes not a little to the charm of collecting in these favoured parts; whilst the

* This latter record is not quite correct in its particulars; vide Entom. xviii., p. 74.

geology of the district is varied and somewhat peculiar, and affords a rich harvest of rarities to the botanist. April was, on the whole, a fine month, but more than usually marred by that fierce, dry wind, the "mistral" (N.W.), with the provokingly cloudless sky that accompanies it, as a rule; whilst it blows, no insect stirs in the open, and the collector's only chance is to seek some of the very sheltered gorges that run up into the surrounding hills. May opened with a fortnight's dull, cloudy, thundery weather, and but little sunshine, or most likely the following list would have been added to considerably.

Papilio sinon, was common in April, revelling in the warmth of rocky hill-sides, where five or six might sometimes be seen together, and early in the month it seemed partial to plum and almond blossom; first seen, April 4th, and onwards through May. *P. machaon*, appeared in sheltered spots and gardens about April 6th, and was less numerous than the preceding.

Thais polyxena, var. *cassandra*, occurred here and there in the plain, by the sides of streams and wet ditches, but occasionally at a slightly higher elevation by small rivulets, on the banks of which its food-plant, the *Aristolochia rotunda*, grows plentifully; some specimens approached the type very nearly; I have been told the variety, usually taken here, is that called *ochrea*; first seen, April 6th, and throughout the month. *T. rumina*, var. *medesicaste*, is a much scarcer insect usually, and occurs as a rule singly, in dry, warm, sheltered slopes, where the *Aristolochia* grows; on May 3rd the writer was fortunate enough to find this butterfly in profusion; some specimens exhibited an almost total suppression of red markings on the fore wing; first seen, April 13th, and it occurred up to May 24th.

Aporia crataegi, common; first seen, May 7th.

Pieris brassicae, *P. rapae*, and *P. napi* were all very common. *P. daphidice* was fairly common all April, chiefly in the plain, at the flowers of Cruciferae, such as *Biscutella*; at Bordighera it was common from the beginning of February; var. *bellidice* was rare.

Euchloë belia, was locally common on cistus-covered slopes; its habit of flight reminds one of *Colias edusa*; first captured, April 2nd, thence onward through April and May. *E. cardamines*, common in pine woods from April 13th, females being a little later than males in appearance. *E. eupheno*, var. *euphenoides*, in same situations as last, and from same date; it is easily captured, often settling on crucifers; females later and scarcer.

Leucophasia sinapis, appeared first, April 18th, in open spaces in woods; aberration *erysimi*, occasionally in May; and aberration *lathyri*, now and then.

Colias edusa, was common throughout April and May, flying over wheat-fields and sainfoin; var. *helice*, sparingly.

Gonopteryx cleopatra, very common; April and May.

Thecla rubi, abundant in and near woods.

Thestor ballus, locally common where wild thyme abounds, on sheltered southern slopes, settling on the flowers or on leaves, or the ground; it occurred all through April.

Polyommatus alciphron, var. *gordius*, taken here and there in small numbers on dry, warm, stony slopes; the males are much suffused with blue; May 10th and onwards. *P. phlaeas*, common on sunny banks.

Lycana agon, occurred very sparingly on the sea-shore, near La Plage; first seen, May 20th. *L. baton*, first seen, April 5th; locally common, frequenting thyme flowers in old quarries; var. *panoptes*, also common locally. *L. astrarche*, not very common; first seen, April 22nd. *L. icarus*, dark in colour, fairly common over sainfoin and meadows. *L. corydon*, occurred sparingly on lavender flowers and by road-sides; first taken, May 19th. *L. argiolus*, common all April over shrubby growth on hills. *L. sebrus*, single specimens here and there, commoner at Montrieux near Hyères, and Mount Coudon at beginning of May. *L. semiargus*, was also very scarce. *L. minimus*, common locally, as at Mount Coudon, May 13th. *L. cyllarus*, fairly abundant from beginning of May; specimens of males and females occurred without ocelli on under side of hind wings. *L. melanops*, first taken, April 14th; very local on cytisus and other shrubs on southern slopes; females ten days later.

Nemeobius lucina, occurred at beginning of May, sparingly, at Montrieux, near Hyères.

Libythea celtis, seen two or three times; a rarity in these parts.

Charaxes jasius, occurred in the larva state on arbutus at the beginning of April. Mr. Kane, in his usually excellent 'Handbook of European Butterflies,' says, p. 54, "the chief emergence is in first half of May"; this is the case in the breeding-cage, but not under natural conditions. Resident collectors at Hyères tell me that it very rarely, if ever, occurs the open until the first week in June. I mention this, as Mr. Kane's statement is misleading to some extent.

Apatura ilia, aberration *clytie*, occurred sparingly round poplars at Montrieux, near Hyères, about May 19th.

Limenitis camilla, first captured, April 27th; was fairly common in sunny glades in woods, and by hedgerows; some specimens were very large.

Vanessa egea, was only seen twice; it is very rare at Hyères, but common at several places on the Eastern Riviera. *V. polychloros* and *V. c-album*, pretty common here and there. *V. urticae*, very rarely seen. *V. io*, common; *V. antiopa*, also common; as were *V. atalanta* and *V. cardui*.

Melitaea aurinia, var. *provincialis*, the peculiar form found here, common, but very local; settling on the handsome yellow flowers of the *Linum campanulatum*; April 28th, &c. *M. didyma*, of unusually deep colour; occurring fairly abundantly in valleys from May 10th; some females of this species had very dark fore wings, reminding one strongly in colour of *A. paphia*, var. *valesina*, the hind wings in these specimens being as type. *M. cinxia*, the commonest butterfly here; first seen, April 7th. *M. phæbe*, also abundant, but more local than last insect. *M. parthenie*, very local in warm valleys; first seen, May 20th.

Argynnis latona, appeared here and there from April 2nd. *A. euphrosyne*, was of very large size and rich colour; some specimens measured nearly $2\frac{1}{2}$ inches in expanse; first taken, April 27th. *A. dia*, occurred sparingly from end of April.

Melanargia sylvius, taken commonly, but locally, from May 12th; specimens occurred over $2\frac{1}{2}$ inches in expanse; flies over grass slopes, and settles frequently.

Pararge mæra, here and there over rocky dry water-courses in the mountains, from May 15th. *P. megæra*, common everywhere. *P. egeria*, common in shady lanes, and among foliage. They were all of the southern type of colour.

Epinephele ianira, males were common from May 15th; specimens are very large. *E. pasiphaë*, on hill-sides; common locally.

Cænonympha pamphilus, common everywhere.

Spilothyrus alcea, was fairly common in warm dry nooks all April.

Syrictus sida, very local; occurred in clearings in woods here and here in small numbers; flies rather late in afternoon. *S. malea*, abundant. *S. orbifer*, occurs sparingly in May. *S. sao*, fairly common over flowers of lavender and thyme.

Nisoniades tages, common in stony valleys near sea.

I was disappointed in not meeting with the tailed blues, *L. telicanus* and *L. bætica*, and others that should have been at; but, as I have said, the season was not very propitious.

Hyères, May 24, 1889. (20, Courtfield Gardens, Earl's Court, W.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

SPRING RHOPALOCERA.—It will be encouraging to beginners to know that I have, this season, taken no less than twenty-four species of butterflies up to the 15th of June, in one locality in Surrey. Most of them were comparatively abundant.—JOHN T. CARRINGTON.

COLIAS EDUSA IN WALES.—I saw a specimen of *Colias edusa*, a male, I believe, on the wing this morning, a few miles from here. It will be interesting to notice whether we are at last going to have a "clouded yellow year," though I presume the one I saw had hybernated.—W. E. R. ALLEN; Porthkerry Rectory, Cowbridge, S. Wales, June 13, 1889.

SCARCITY OF THECLA W-ALBUM.—It does not seem to be a good year for *Thecla w-album*, as I have only taken one or two of the larvæ and pupæ in places where last year I took several dozen.—W. E. R. ALLEN; Porthkerry Rectory, Cowbridge, S. Wales, June 13, 1889.

VANESSA MILBERTII.—I have to-day taken an example of *V. milbertii* here, at West Cliff, flying on a dry sunny bank near a swamp, where *Antiope* and *Pyrameis cardui* were also on the wing. It is a variety, which I will call *subpallida*, characterised by the broad reddish fulvous and on the upper side being, at its upper extremity and for a considerable area about its middle, of a pale yellowish colour. Prof. French ('Butterflies of the Eastern United States,' p. 195) has also recorded this form from Colorado, where he says, "one example from Colorado has fully half the pale band buff." This is very interesting, because it is one of those pale forms produced in the arid region, where we see that as moisture causes darkening, so dryness tends to bleach; and this is so noteworthy in parts of Arizona and Mexico as to give a special character to mammals, birds, and insects alike. Lately we have found *Aphodius vittatus* here in considerable plenty; and although

this species presents a black variety, all the West Cliff examples are of the form that has patches of red on the elytra, like the *Aphodius plagiatus* on the continent of Europe.—T. D. A. COCKERELL; West Cliff, Custer Co., Colorado, May 19, 1889.

CANNIBALISM OF ARCTIA CAIA.—A short time ago I took several larvae of *Abraaxas grossulariata* and also a larva of *Arctia caia*, and I put them together in one cage. This morning I saw that the larva of *A. caia* had attacked one of the *grossulariata*. Examining it more closely I found that it was eating the *grossulariata*. There was plenty of food in the cage, so that that was no reason why it should turn cannibal.—HUGH JACKSON; Houghton, 9, The Drive, Brighton, June 5, 1889.

OCNERIA DISPAR.—I have bred *Ocneria dispar* for many years from the egg. In the open air they proved a failure,—every caterpillar died. I next tried them on a high kitchen-shelf, a couple of yards to the right of the fire-place, feeding the larvæ on whitethorn. My plan, which I follow in all hatching operations, was to place the eggs in a small Liebig's Extract of Meat jar, covering with a piece of muslin, and fastening the latter with an elastic-band. I then placed on the top of the jar a small square of glass, and lifted it occasionally to admit air. The glass prevented the food from drying. As soon as possible the larvæ were transferred to a good-sized flower-pot covered with muslin, but without the glass, and, when the size of the caterpillars allowed, a covering of net was substituted for the muslin. The food, after dispensing with the glass, required to be renewed two or three times a day. The loose withered leaves were allowed to remain in the pot, and upon these the pupæ formed without web or cocoon. The moths emerged in about a fortnight, pupa after pupa to the very last one; and I well remember what a lively lot the males always were. The specimens in my cabinet measure as follows:—Males, nearly 2 inches from tip to tip; females, nearly 2½ inches. I cannot remember ever breeding a single cripple.—J. ARKLE; 2, George Street, Chester, June 3, 1889.

AGLIA TAU.—I encountered this insect under somewhat different circumstances to those described by Mr. Swinton (Entom. 139), while Wiesbaden, last year. There, undoubtedly, *Aglia tau* preferred the shade of the trees in the extensive elevated woods of the district. They began to appear precisely with the unfolding of the beech leaves, in the spring. I observed them first on the 2nd of May. They continued abundant throughout the month, the males flying in the heat of the day, darting in and out among the trees in search of the females, and were by no means easy to net; one rarely saw them on the wing except during sunshine. The females I took on two or three occasions, flying just before dusk. I also took several of these at rest on beech trunks during the day, and once a pair in copula in the same situation. The females laid freely in captivity. The eggs are large, reddish brown, and somewhat oval in shape, with a slightly corrugated surface. The larvæ hatching from these are very beautiful, being pale green, with a few long branched spines of a pink colour. All mine accidentally perished at this stage, but I met with the full-grown larva in August crawling down the beech trunks; it is then quite different, being dull green, with no spines, but covered with short bristles, which give it a roughened appearance, and tapering towards the head and tail. I searched, but unsuccessfully, for the pupa about the roots

of trees the following October.—R. M. PRIDEAUX; Woburn Place, W.C., June, 1889.

ACRONYCTA ALNI NEAR YORK.—Whilst entomologising at Askham Bog, near York, on the 13th instant, I netted a fine imago of *Acronycta alni*. It was hovering above my head among birch.—E. G. POTTER; 19, Price Street, York, June 17, 1889.

CARADRINA QUADRIPUNCTATA, HYBERNATING.—With regard to Mr. Blagg's note on *C. quadripunctata* (*cubicularis*), *ante*, p. 162, it has opened up a question about which, I suppose, few lepidopterists could give a satisfactory answer, *viz.*, How does this species pass the winter? My experience is that it is in the imago state. It can be obtained throughout the winter in the stacks of hop-bine, so frequent in Kent, and occasionally from thatch. An Aberdeen lepidopterist wrote to me only this winter about finding an imago in January or February, and asked me whether it was unusual. I had no hesitation in answering in the negative. The specimens obtained in the winter months are in equally good condition with those obtained in the summer, and it suggests itself whether the larvæ from the summer brood feed up and emerge normally in late autumn and then hibernate; certain it is that a part of the brood must generally do so. I see Merrin's 'Calendar' gives the date of the imago as May to October. Facts would lead one to substitute May to May, for I believe that good specimens can be obtained every month in the year.—J. W. TUTT; Rayleigh Villa, Westcombe Park, S.E.

AGROTIS CINEREA.—On the 6th of June I took a fine male specimen of *Agrotis cinerea* from a lamp-post near here; and on the evening of the 9th I took a fine variety of the same insect, with the outer half of the wings dark, from a lamp-post at Polegate.—H. G. PLACE; 53, Buckingham Road, Brighton, June 13, 1889.

FOOD OF *NYSSIA ZONARIA*.—In 1882 I had a few larvæ of *Nyssia zonaria* given to me, with instructions to feed them on yarrow (*Achillea millefolium*). Accordingly I procured some well-seasoned leaves of this plant, with which the larvæ were supplied, but to my sorrow they refused to feed upon it, and in the course of a week pined away and died. Was it the journey that sickened them? or was it improper food? With regard to the food-plant, the following may be of interest. Whilst collecting on the Conway sand-hills, near the Penmaenmwr rocks, on June 18th, 1885, I discovered the larvæ of *N. zonaria* in abundance, feeding upon bird's-foot trefoil (*Lotus corniculatus*). To make sure that they were feeding upon this plant, some turf was cut, which contained both yarrow and trefoil. Upon this the larvæ were placed, and the result was that they ate every leaf of the latter, but left the yarrow standing untouched. The larvæ were then supplied entirely with bird's-foot trefoil, upon which they thrived most remarkably. I should add that the plants selected for food were obtained from the coast, or from well-exposed situations; coarse, rank foliage was never given them. I believe *N. zonaria* will also feed upon *Centaurea*, but I have never tried it.—R. NEWSTEAD; Curator, Grosvenor seum, Chester, May, 1889.

HYSPETES RUBERATA IN ABERDEENSHIRE.—My wife took a very fine form of this moth at rest on the staircase of our house on May 20th,

1889, and I netted a few myself in the first week of June, flying at birch trees. I have never heard of its being recorded from Aberdeen before.—L. G. ESSON; 46, North Charlotte Street, Aberdeen, N.B. [This species usually frequents sallow or willow, and flies late at night.—ED.]

PSEUDO-MELANISM.—Dr. T. A. Chapman first drew my attention to the fact that certain species of Noctuæ appear to be melanic when worn. *Acronycta psi*, apart from the fact that there are dark varieties, exhibits this apparently melanic tendency, specimens of the pale form appearing much darker when they begin to be worn. *Leucania conigera* and *Taxinocampa miniosa* exhibit this peculiarity in a very marked degree: *Oporina croceago*, also, to a less extent. I have noticed the same tendency in *Mamestra sordida*, *Hecatera serena*, and *Aplecta nebulosa*. It would be interesting to know what other species exhibit this tendency.—J. W. TOTT; Westcombe Park, S.E.

EXTRACTION OF MOTH FROM PUPA.—Last year I had about a dozen pupæ of *Dicranura vinula*, and in May most of them had emerged; but one, though it had already made a small perforation in the cocoon, seemed from some cause unable to make its escape. Having waited for a day, and seeing that the insect still remained the same, I carefully peeled off a small portion of the cocoon, taking especial care not to injure the enclosed insect. The imago then crawled out, but its wings never expanded, although there is no doubt but that the experiment was made at the right time. It seems that assisting moths to emerge is more likely to result in cripples than to prove successful.—H. D. SYKES; "The Cedars," Enfield, May 13, 1889.

[There would seem to be as much evidence that the moth was imperfect originally, and that this caused non-emergence, as that the assistance was the cause of crippling. Perhaps the pupa was kept too dry.—ED.]

THE YELLOW TINGE OF SOME NEWLY-EMERGED MOTHS.—Mr. F. W. Papple has some interesting remarks in the December No. of 'Science Gossip', 1888, relative to the yellow tinge of newly-emerged examples of *Leucosalicis*, which he attributes to "the fluids contained in the wings not being completely absorbed." In this connection I may mention that I bred some specimens of *Gnophala vermiculata* from larvæ found here on *Mertensia*, and on July 4th took note of a freshly-emerged example. The white portion of the wings were decidedly tinged with yellow, tending to primrose, while the white lateral marks on the body were without any of the yellow tinge. Probably this yellow tinge is observable in other white Bombycid moths on emergence, but it seems not to have been generally noticed.—T. D. COCKERELL; West Cliff, Colorado.

THE DESTRUCTION OF LEPIDOPTEROUS LARVÆ BY SUMMER FROSTS.—With regard to this question (Entom. 164), I should have imagined that larvæ accustomed to a warm temperature generally, would be liable to be destroyed by a sudden fall to the freezing-point, in the same way that plants of different kinds suffer. Some of the imagines perish from the same cause. Newman observes of the males of *Cidaria miata*, "it is presumed he perishes with the early frosts." Kollar on 'Insects Injurious to Gardeners,' &c., observes in the chapter, "Means of Defence against Noxious Insects": "Late frosts are also very beneficial, as they entirely destroy many insects in their larva state. I had an opportunity, early in the summer of 1833,

of observing great devastations on the fir trees in the neighbourhood of Vienna by a species of sawfly (*Tenthredo rufa*, Klug.) . . . Fortunately, in the month of May, a moderate frost set in, and thousands of the larvæ were seen hanging to the twigs, scorched." Kirby and Spence, it will be remembered, has the following, on "the subject of Hybernation":—"Many insects, though able to sustain a degree of cold sufficient to induce torpidity, would be destroyed by the freezing temperature, to avoid which they penetrate into the ground, or hide themselves under non-conducting substances; and there can be little doubt that it is with this view that so many species, while pupæ, are thus secured from cold by cocoons of silk or other materials." The case of some hybernating larvæ I take to be somewhat different, according to the editorial remarks: they have without doubt "inherited" the power, originally given them, of hybernating from some peculiar state of their formation. Is it not the case that other hybernating larvæ, those which conceal themselves, are liable to destruction by frosts, when they have been tempted forth by unusually mild weather very early in the season? It is well known how sensitive Lepidoptera are to changes of temperature. Might not some of their larvæ escape the effects of summer frosts by concealing themselves; whilst others, which had not taken sufficient protection, be destroyed?—T. B. JEFFERYS; Clevedon, June 10, 1889.

MIGRATION OF LEPIDOPTERA.—Previous to the 1st of June I had not seen a single hybernated *Vanessa cardui* nor one *Plusia gamma* in Surrey, where I have collected several times weekly since the season opened. On that day one *V. cardui* was captured, but on the 3rd of June *V. cardui* was abundant, in fact hundreds were seen, as were *P. gamma*. Both species gradually disappeared during the week, and were afterwards only occasionally to be observed. There had been a steady south-east wind for the three days before June 1st.—JOHN T. CARRINGTON.

MIGRATION OF DRAGONFLIES.—In a note recently received from Mr. H. Gatke, of Heligoland, he says, "Have you had any arrival of dragonflies, *Libellula quadripunctata*? Here, on May 21st and 22nd, they swarmed by the million, and continued to the 26th, when the wind became northerly, and next morning not a single one was to be seen." It will be interesting to learn if any have been observed on our east coast, or on the light-vessels in the North Sea.—JOHN CORDEAUX; Great Cotes, Ulceby, June 1, 1889.

SPRING INSECTS IN MIDDLESEX.—In reference to the month that ends to-day, the earlier appearance of insects this season as compared with last will no doubt be remarked on. The earliest date at which I noticed Neuroptera, Agrionidæ, and *Libellula depressa* was May 19th, about Belmont and Canons Wood Park, between Harrow and Staunmore. Up to May 25th Diptera were very abundant, and *Empis tessellata* notably so. What a number of other common species—as the blue-bottle, dungfly, duddy long-legs, &c.—fall victims to this insect. The cold and wet of the last four or five days has materially diminished the number of insects generally. The genera *Eristalis* and *Syrphus* have been well represented; *io marci* and *Leptis scolopaceus* have likewise been observed, but are not common. Respecting Hymenoptera, I have seen very few wasps as yet, fewer than last year. The fact that I captured fully twenty females last spring, thereby preventing twenty nests, may have had something to do with their comparative rarity at Cricklewood this season. Bombi, again,

are not more plentiful this year, though I have not observed them so carefully, having got a set of all that I have seen in this neighbourhood. Smaller genera, *Andrena* and *Osmia*, the former of the two being particularly abundant, have been captured on the blossoms of the pear, plum, &c. Among Ichneumonidæ, *Lampronota bellator*? continues, as previously, common. Our local Rhopalocera are very few in number, and of the commonest. I have been enabled to add *Gonepteryx rhamni* to the local list. Coleoptera, Hemiptera, and Orthoptera, here, are few and far between. With regard to the Coleoptera, the soil no doubt has a great deal to do with it. I rarely succeed in augmenting the catalogue of these groups. This is the first season that I have seen *Sialis lutarius* at all plentiful. Many fall into the ponds, and are only extricated with their smoky-coloured wings too limp and dragged to admit of effective setting out. *Panorpa germanica* occurs here, but very sparingly. If I had taken pains with the Heterocera, I might have drawn up a more numerous list, but I rarely meddle with the Micros, as I am sure to damage them, either in killing or setting out. I have added four species of Hymenoptera to the list within the last week or two.—F. A. WALKER; Dun Mallard, Cricklewood, May 31.

HESSIAN FLY.—The first Hessian fly specimens for 1889 came to hand this morning, in the larval state, and apparently full grown. They were on the small under shoots of wheat, which plant is just coming into ear. They were from Revell's Hall, near Hertford, and are sent me by Mr. G. Palmer, who first noticed the fly in England.—ELEANOR A. ORMEROD; Torrington House, St. Albans, June 14, 1889.

COLORADO HYMENOPTERA.—*Agama glabella*, alluded to Entom. xxi. 301, is by no means an ichneumon, as there stated, but is a species of Mutillidæ, having a superficial resemblance to the ichneumons. The species is, perhaps, better classed as *Photopsis glabella*; while a second species from Cottonwood Springs, Pueblo Co., has been identified by Mr. W. H. Ashmead as *P. ampla*, Blake. Mr. Ashmead also identified *Polistes variatus*, Cress., from the same locality; and the "*Sirex*" preyed upon by *Thalessa* (p. 302) proves to be a *Tremex*, at first considered a new species (*T. hospes*), but now referred by Prof. Riley to a new western race of *T. columba*, L. The Mutillidæ are quite numerous in Colorado, species of *Spharophthalma* being very noticeable, running over the ground in dry sunny spots; while *Photopsis* comes very numerous to light, so as to be quite a nuisance.—T. D. A. COCKERELL; West Cliff, Colorado, May 2, 1889.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*June 5th, 1889.*—The Right Honourable Lord Walsingham, M.A., F.R.S., President, in the chair. Mr. W. M. Christy, of Watergate, Emsworth, was elected a Fellow; and Mr. W. F. Blandford and Mr. C. Cave were admitted into the Society. Mr. S. Stevens exhibited a specimen of *Acrolepia assectella*, Zeller, included in a lot of Tineidæ purchased by him at the sale of the late Mr. A. F. Sheppard's collection, and determined by Mr. Stainton. He also exhibited, for comparison, a specimen of *A. betulella*. Mr. J. J. Walker, R.N., exhibited a collection of Lepidoptera made in 1887 and 1888 in the

immediate vicinity of the Straits of Gibraltar. The collection included sixty-eight species of butterflies, of which thirty-six were obtained on the Rock of Gibraltar itself, and the remainder on the European side of the Straits, and about 160 species of moths. Dr. P. B. Mason exhibited a number of specimens of a South-European species of Ant—*Crematogaster scutellaris*, Oliv. He said that the specimens were all taken in the fernery of Mr. Baxter, of Burton-on-Trent, and had probably been imported with cork. Mr. O. E. Janson exhibited a pair of *Neptunides stanleyi*, a species of Cetoniidæ, recently received from Central Africa, and described by him in the February number of the 'Entomologist'; also some varieties of *N. polychrous*, Thoms., from the Zanzibar district. Dr. N. Manders exhibited a number of Lepidoptera collected by himself in the Shan States, Upper Burma; also a collection of Lepidoptera made by Captain Raikes in Kàrenni. Mr. M'Lachlan exhibited over 400 specimens of Neuroptera, being a portion of the collection formed in Japan by Mr. H. J. S. Pryer. They represented nearly all groups (excepting *Odonata*, now in the hands of Baron DeSelys). Some of the Ascalaphidæ, Panorpidæ, and especially Trichoptera, were of great beauty; notably amongst the latter was the curious moth-like genus *Perissoneura*, M'Lach. Dr. Sharp exhibited the peculiar cocoons of an Indian moth, *Rhodia newara*, Moore; these were the cocoons possessing a drain at the bottom in order to allow water to escape, already described in the 'Proceedings of the Zoological Society' for 1888, p. 120, where, however, their great resemblance to the pods of a plant had not been alluded to. Mr. Enoch exhibited, and made remarks on, specimens of *Cecidomyia destructor*, bred from American wheat. Mr. W. Warren exhibited a bred specimen of *Retinia posticana*, Zett., from Newmarket; also specimens of *Eupithecia jasionæata* and *Gelechia confinis*, bred by Mr. Gardner, of Hartlepool. Mr. C. O. Waterhouse exhibited and explained a number of diagrams illustrative of the external characters of the eyes of insects. A discussion ensued, in which Mr. M'Lachlan, Mr. Verrall, Lord Walsingham, Mr. Jacoby, Mr. Kirby, and others took part. Mr. A. G. Butler communicated a paper entitled "Descriptions of some new Lepidoptera-Heterocera in the collection of the Honble. Walter de Rothschild." He also contributed a second paper entitled "Synonymic Notes on the Moths of the earlier genera of Noctuites." Dr. Sharp read a paper entitled "An Account of Prof. Plateau's Experiments on the Vision of Insects." Lord Walsingham, Mr. Jacoby, Mr. White, and Mr. Waterhouse took part in the discussion which ensued.—H. Goss, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—May 23rd, 1889.—T. R. Billups, F.E.S., President, in the chair. Mr. Tugwell exhibited *Acidalia aversata*, bred from a strongly-banded grey form; the only examples bred were specimens of a rich ochreous brown banded form and the var. *spoliata*. Mr. Tutt, long series of *Cidaria truncata* and *C. immanata*, also *Tephrosia crepuscularia* and *T. biundularia*, and made some observations on the two last species. Mr. South, long series of *Hypsipetes sordidata*, comprising examples of the species from various English and Scotch localities, also of *Larentia didymata*, and read notes relative to his exhibit. Mr. White, Hymenoptera collected in the neighbourhood of Colchester. Mr. Billups, *Lithocharis piceus*, *Actobius signaticornis*, and *A. villosulus*, from Lewisham; also the ichneumon *Banchus variegator*, bred from *Panolis piniperda*, and *Ophion luteum*, bred

from *Dicranura vinula*. Mr. Carrington contributed notes on collecting at Horsley, Surrey. Mr. White read a paper, "Observation *versus* Collecting."

June 13th, 1889.—John T. Carrington, F.L.S., Vice-President, in the chair. Mr. Moore exhibited species of Lepidoptera from Antigua. Mr. Wellman, *Macroglossa fuciformis* and *Nemeobius lucina*; also living larvæ of *Halia vaularia*, showing variation. Mr. Helps, *Selenia tetralunaria*. Mr. Robson, specimens of *Sesia formicæformis* with yellow bands. Mr. South exhibited specimens of *Cidaria truncata* and *C. immanata* from various localities, and referred to the first named as having been honoured with no less than eight names, and having been placed in half as many genera, not including *Phalaena* and *Geometra*, which were rather tribes or divisions than genera. Seeing how variable the species was, the multiplicity of trivial names was hardly matter for surprise; few, if any, of the entomologists of the present day were inclined to claim specific rank for the forms now so generally admitted to be aberrations of *C. truncata*. As regards *C. immanata*, this insect was not so deeply involved in the synonymic web as that previously considered. Mr. South then proceeded to refer to the various forms and varieties, and illustrated his remarks by his exhibit. Mr. Tugwell made some observations on collecting during the present season.—H. W. BARKER, *Hon. Sec.*

Excursion, June 22nd, 1889.—The first summer excursion of the season took place under the guidance of Mr. John T. Carrington to Horsley, Surrey. The party, which numbered upwards of a score, was conveyed in carriages from the station to Netley Heath, where collecting commenced.

REVIEWS.

Notes and Descriptions of a few Injurious Farm and Fruit Insects of South Africa. Compiled by ELEANOR A. ORMEROD, F.R. Met. Soc., &c. London: Simpkin, Marshall & Co. 1889.

This little work of 110 pages is compiled from material supplied by Mr. S. D. Bairstow, President of the East Province Nat. Hist. Soc. of Cape Colony. Many of the species are actually new to science and have been described especially for this work by Mr. Oliver E. Janson, F.E.S. Altogether, Miss Ormerod has noticed about fifty kinds of injurious insects, and the pages are profusely illustrated by woodcuts. The work cannot fail to be of much practical value to the Colony, as the talented authoress has had under consideration the commoner pests of South Africa.—J. T. C.

A Contribution towards a Catalogue of the Neuropterous Fauna of Ireland. By JAMES J. F. X. KING. Glasgow, Nat. Hist. Soc., 207, Bath Street. 1889.

Any contribution to a knowledge of the fauna of Ireland should be welcome, no matter how fragmentary. Doubtless, as Mr. King expresses in his opening remarks, much remains to be done in working out this group in Ireland. Encouragement will be found in the fact that although so little, comparatively, has been effected in this direction by entomologists in that country, four species at least have been found there, which have not yet occurred in Great Britain. In a summary of species at the end of the work there have been noticed a total of 73 genera and 211 species of Neuroptera as against 129 genera and 350 species recorded in Great Britain.—J. T. C.



Group of *Atherix ibis* and parasites.

THE ENTOMOLOGIST.

VOL. XXII.]

AUGUST, 1889.

[No. 315.]

NOTE UPON *ATHERIX IBIS*, FABRICIUS.

By T. R. BILLUPS, F.E.S.

(PLATE 7.)

THE very curious group of Diptera figured on plate 7, by Mr. Frohawk, was found in the neighbourhood of Condover, near Shrewsbury, by Mrs. Close, of Condover Hall, who sent the mass of flies to the editor of the 'Field' newspaper for identification.* In due course they were handed to Mr. John T. Carrington, who, finding some living Hymenoptera among them, kindly sent them on to me for examination.

This group was found attached to a willow twig, which was part of a bush overhanging a lake. It consists entirely of females of *Atherix ibis*, one of the family Leptidæ, which inhabit fields and woods near water. *A. ibis* is a somewhat local insect, that has been recorded from various localities in England and Scotland, but is common in many places on the continent of Europe.

When about to deposit her ova, the female *A. ibis* generally selects the branch of a tree or bush overhanging water, preferably a running stream. Upon this twig she deposits her eggs, and then almost immediately dies. She is followed by others, which conduct themselves in like manner, to the same spot, and so form the pear-shaped mass (as illustrated), varying in size to several inches long, and proportionately wide in diameter. These females, which often number many hundreds, deposit their eggs upon each other when the twig has become covered. The larvæ hatch from these ova, and fall into the water below to undergo their metamorphoses therein.

Curtis, in 'British Entomology,' where he figures both male and female, says that the males may be found in numbers on the banks of rivers after floods.

* [The block illustrating this plate has been kindly lent to the editor of the 'Entomologist' by the proprietors of the 'Field.'—J. T. C.]

The wings of *Atherix ibis* are grey, with black irregular spots the thorax is also black, having two grey dorsal stripes; the space between the eyes in the female being dirty yellow in colour. In both sexes the legs are tawny. The abdomen in the male is tawny, with a black base and tip, and a row of black spots running down the centre. In the female the abdomen is dark grey, with lighter transverse bands. In length it measures about half an inch, and the expanded wings extend rather more than an inch from tip to tip.

The habit of dying immediately after ovipositing is apparently common to the family Leptidæ, which fact was illustrated upon the recent visit of the South London Society to Westerham, in Kent, on the 20th July this year, when Mr. R. Adkin found one species upon the trunk of a tree, dead, by the side of its eggs.

As already mentioned, some living insects were observed among the mass of dead flies. These I found to be of two species of Hymenoptera, both parasitic upon the eggs of *A. ibis*. One species was reared in extraordinary numbers, and most minute in size, being less than one hundredth part of an inch long. Although so small they are remarkably active, their legs being clearly formed for running and leaping. These small insects, which look to the naked eye no longer than specks of dust, are of the genus *Teleas*, having elbowed-twelve-jointed antennæ inserted near the front of the head. These antennæ are slightly hairy and simple in the male, but in the female they are terminated by a six-jointed club. The thorax is short, the abdomen being pedicellate.

Of the second species of these Hymenoptera I only reared two specimens, which are *Antæon alorus*, Walker. According to Professor Westwood, the type of this minute genus is *Ichneumon ovulorum*, Linn.

I shall be glad to hear from other entomologists who have made a study of these parasitic Hymenoptera, with a view to finding out if they have reared more than two parasites from the larvæ or ova of *Atherix ibis*.

There is, I feel sure, an immense field for investigation among Hymenoptera parasitic upon ova of insects, of which there are many species in this country. Their larvæ feed upon the juices contained in the eggs of insects, and they become full-fed within the shell, emerging as perfect ichneumons. They seem to attack ova of nearly all orders of insects, especially Diptera, Lepidoptera, and Hymenoptera; and where they do occur, they are generally in great numbers.

DESCRIPTION OF PLATE 7.—Fig. 1. Group of female *Atherix ibis*. 2. *Atherix ibis*, life-size. 3. Head and antennæ of *Antæon alorus*, male. 4. *Antæon alorus*, female. 5. *Teleas* sp., apterous, female. 6. *Teleas* sp, male.

20, Swiss Villas, Coplestone Road, Peckham, S.E., July 22, 1889.

BRITISH ORTHOPTERA.

By EDWARD INGLEBY MILLER.

(Concluded from p. 175.)

ACRIDIDÆ.

= GRYLUS-LOCUSTA, L.; GRYLUS, Fab.; ACRIDII, Latr.; ACRIDIODEA, Wat.; LOCUSTIDÆ, Leach.

Thirteen species. Diurnal insects. The migratory locusts, which do so much damage in foreign countries, belong to this family, and several of them have appeared in this country at various times. These insects are found in fields, sandy heaths, and marshes; they stridulate by rubbing the hind legs against the elytra.

TABLE OF GENERA.

- I. Prothorax simple.
 - 1. Elytra and wings very short - - - - PEZOTETRIX.
 - 2. Elytra and wings perfectly developed.
 - a. Head (seen from above) not more than half as long as pronotum - - - - CEdIPODA.
 - b. Head (seen from above) more than half as long as pronotum.
 - a. Species larger.
 - AA. Space between eyes less than their length - LOCUSTA.
 - BB. Space between eyes not less than their length PACHYTILUS.
 - b. Species smaller - - - - STENOBOTHRUS.
- II. Prothorax produced behind over the abdomen - - - - TETRIX.

1. STENOBOTHRUS, Fisch.

These insects are our common grasshoppers, which we so often hear in sunny pastures. Most of the species are very variable in colour.

- I. Antennæ not thickened at the apex (Rhammatocerus).
 - 1. Elytra of female about half the length of the abdomen; of male scarcely as long as the abdomen - - *parallelus*.
 - 2. Elytra of female about as long as the abdomen; of male longer than the abdomen.
 - a. Outer carinæ on thorax comparatively straight - *elegans*.
 - b. Outer carinæ on thorax curved.
 - a. Elytra distinctly spotted - - - - *rufipes*.
 - b. Elytra not spotted.
 - AA. A white streak on costal margin of each elytron *lineatus*.
 - BB. Elytra without a white streak - - - - *viridulus*.
 - c. Outer carinæ on thorax angular - - - - *bicolor*.
 - II. Antennæ thickened at the apex (Gomphocerus).
 - 1. Anterior tibiæ of male thickened - - - - *sibiricus*.
 - 2. Anterior tibiæ simple in both sexes.
 - a. Elytra and femora distinctly spotted - - - - *biguttatus*.
 - b. Elytra and femora scarcely, if at all, spotted - - *rufus*.
1. *S. elegans*, Charp., 1825. = *tricarinata*, Steph. — Not common; it occurs in marshes in the East of England.
2. *S. parallelus*, Zett., 1821. = *pratorum*, Fieb. — A very distinct species, easily recognised by the shortness of the

elytra. Very abundant in fields from July to September. Fig. 8.

3. *S. lineatus*, Panz., 1796. = *megacephalum*, Steph.; *tenellus*, Stoll.; *fischei*, Eversm.; *nigro-maculatum*, Schæff.; *stigmaticus*, Fieb.—This insect often has a white spot on the elytra, but it is a green species, and cannot be confounded with *S. rufipes*, which is never of that colour. Not common; occurring in fields and meadows during August and September.

4. *S. viridulus*, L., 1761. = *albo-marginatum*, DeGeer, ♀; *rufo-marginatum*, DeGeer, ♀; *nigro-terminatum*, DeGeer, ♂; *rubicunda* (Schæff.), Gmel.—Occurs in sandy places from June to September.

5. *S. bicolor*, Charp., 1825. = *vittata*, Steph.; *modestum*, Seidl.; *murina*, Fieb.—Very common and extremely variable in colour. Found in fields from July to September.

6. *S. rufipes*, Zett., 1821.—This species may be distinguished from *S. bicolor* (which resembles it in very often having the elytra spotted) by the posterior tibiæ, which in the male of this species are reddish with the extreme base and apex dark, and in the female dark, with the portion just below the base pale; whereas in *S. bicolor* they are unicolorous in both sexes. Not uncommon in the South of England; found in fields and meadows during June and July.

7. *S. biguttatus*, Charp. = *pulla*, Fisch.; *biguttulus*, Panz. (nec L.); *rufus*, Zett., var.; *elegans*, Steph., var. ?; *ericetorius*, Steph., var. ?; *calidoniensis*, Stoll.; *maculatus*, Thunb.—Variable in colour. Common on sandy heaths from July to September.

8. *S. rufus*, L., 1766. = *clavicorne*, DeGeer, var. *maculatus*, Thunb.—This species is figured in Stephens's 'Illustrations of British Entomology,' vi. pl. 28, fig. 6. The antennæ are more thickened at the apex than in *S. biguttatus*. Rather local, occurring in the South of England during July and August.

9. *S. sibiricus*, L., 1766. = *clavimanus*.—This insect is figured in Cuvier's 'Regne Animal,' pl. 86, fig. 3. Stephens says it has been taken on the hills near Netley.

2. PEZOTETRIX, Burm., 1839.

1. *P. pedestris*, L., 1761. = *apterus*, DeGeer.—I have never seen this species, which is said by Stephens to be found occasionally at the end of July within the metropolitan district. A specimen was taken by Mr. Billups at Bookham, in Surrey, on the 26th of October, 1886.

3. STETHEOPHYMA, Fisch.

= MECOSTETHUS, Fieb.

1. *S. grossa*, L., 1766. = *germanicus*, Stoll.; *rubripes*, DeGeer.—Want of information has compelled me to omit this

insect from the table of genera; it is said to occur in fields, but is probably not a native of this country.

4. LOCUSTA, L., 1748.

= SCHISTOCERA, Stol.; ACRIDIUM, auct.

Distinguished from *Pachytylus* by its long narrow form, and the comparatively short space between the eyes; also by the three transverse furrows on the pronotum. Fig. 9.

1. *L. peregrina*, Oliv., 1807. = *rufescens*, Thunb.; *flaviventre*, Burm.—Figured in Cuvier's 'Regne Animal,' pl. 86, fig. 1. This magnificent species occurred in various parts of England in October, 1869, but has not been recorded since; it is a native of Asia and Africa.

5. PACHYTILUS, Fieb., 1852.

- | | | | | | |
|----------------------------------|---|---|---|---|----------------------|
| I. Wings green | - | - | - | - | <i>migratorius</i> . |
| II. Wings yellowish brown | - | - | - | - | <i>flavipes</i> . |
| III. Wings red, with a dark band | - | - | - | - | <i>stridulus</i> . |

1. *P. migratorius*, L., 1793. = *migratorioides*, Reiche.; ? *cinerascens*, Fab.—This fine species is figured in Donovan's 'British Insects,' viii. pl. 270, and in Cuvier's 'Animal Kingdom' (Griffith), xv. pl. 130, fig. 1; it occurs occasionally in this country from August to October in fields, but is not a native. *P. cinerascens* is a variety with the pronotum of equal breadth throughout.

2. *P. flavipes*, Don. (Gmel.).—Easily distinguished from *P. migratorius* by having a distinct yellow stripe on the elytra and three longitudinal carinæ on the pronotum (*P. migratorius* has only one). Occurs in marshes.

3. *P. stridulus*, L., 1761. = *rubripennis*, DeGeer; *fuliginosum*, Oliv.—I have not seen this species; ? indigenous.

6. CÆDIPODA, Burm., 1825.

1. *Æ. cærulescens*, L., 1764. = *cyanoptera*, Ramb.; *sebetium*, Costa, var. β ; *miniatus*, Pallas; *germanicum*, Latr.; *fasciatus* (*athrens*), Ger.; *obscurus*, Petagne; *fabricii*, Fieb., var. *c.*—Distinguished by its prominent eyes, blue wings (which have a dark band near the hind margin), and the shape of the head. Said to occur in fields. Fig. 10.

7. TETRIX, Charp., 1841.

= ACRYDIUM, Curtis.

These remarkable insects are easily known by the prothorax projecting over the abdomen; they are the smallest of our Acrididæ, and occur in fields, heaths, and sandy places.

- | | |
|--|------------------------|
| I. Prothorax extending considerably beyond apex of abdomen | 1. <i>subulata</i> . |
| II. Prothorax extending about as far as apex of abdomen | 2. <i>bipunctata</i> . |

1. *T. subulata*, L., 1761. = *pallescentes*, Zett., var.; *undulatum*, Sow.; *bipunctatum*, Panz.; *bimaculatum*, Herbst; *margi-*

natum, Zett., var.; *humerales*, Zett., var.; *dorsales*, Zett., var.; *meridionalis*, Ramb., var.—Both this species and the next are extremely variable, and some authors have described many of the varieties as different species; but there are only two, which are easily distinguished by the comparative length of the prothorax and abdomen. Common; it occurs from April to October in fields.

2. *T. bipunctata*, L., 1761. = *obscura*, Hagenb.; *nigricans*, Sow.; *laterale*, Zett., var.; *vittatum*, Zett., var.; *binotatum*, Zett., var.; *zonatum*, Zett., var.; *obscurum*, Zett., var.; *ochraceum*, Zett., var.; *hieroglyphicum*, Zett., var.; *scriptum*, Zett., var.; *hilare*, Zett., var.; *variegatum*, Zett., var.; *ephippium*, Zett., var.; *carbonarium*, Zett., var.; *pinnula*, Curt., var.; *scutellatum*, DeGeer, var.—Comparatively shorter and broader than *T. subulata*; it occurs from May to September in fields.

[On page 175 in the first part of my article, *Decticus griseus* was in error printed as "very local and rare"; it should have been "local, but not rare."]

Dulwich Village, Surrey, May, 1889.

ON THE VARIATION OF INSECTS.

By T. D. A. COCKERELL.

(Continued from p. 178.)

Class IV.—VARIATION IN THE PREPARATORY STAGES.*

a. *Larvæ*.

Contrary to what might have been expected, larvæ vary greatly without producing any corresponding variations in the perfect insects arising from them; while, on the other hand, the larvæ of an insect which is exceedingly variable in the perfect state may be very constant in colouring, or if there are variations they may have no relation to those hereafter to be observed in the imago. It is, therefore, broadly speaking, impossible to associate the variations seen in the different stages of insect growth together, and larval variations must be treated, at least for the present, as larval variations alone. In considering these variations, the first thing that strikes us is the frequency of simple dichroism, usually exhibited in green and brown forms, and the apparent spontaneity of this variation without direct reference to external conditions or hereditary influences. On further enquiry, however, we find some striking cases in which the variation appears to be phytophagic, and others in which it is of local distribution. The study

* For lack of information about the larvæ in other orders, I am obliged to confine my remarks in this section entirely to Lepidoptera.

of larval variation, like that of the earlier stages of larvæ, is yet entirely in its infancy, and it is not likely that progress will be made until the matter is worked up in some systematic way. I think, myself, although I fear many will entirely disagree with me, that variations in all the preparatory stages ought to be duly registered in our catalogues and treated of in our systematic works under names indicating their peculiarities. Thus:—*Dilophonota ello* var. larvæ *viridis* will mean the green variety of the larva of this moth, while *Papilio asterias* var. pupæ *viridis* is the green form of the pupa of the black "swallow-tail." For brevity, "var. larvæ" and "var. pupæ" might be abbreviated to "l." and "p." It will, no doubt, be urged against this proposition that such an arrangement would enormously increase our already lengthy catalogues, rendering the study of Entomology more complex than ever before; but in reply it can only be said that, after all, we are not responsible for the number of the forms that Nature in her bounty has provided, and that, as a matter of fact, Entomology is a far more complex study than is generally supposed; and it is the business of the true naturalist to examine and to classify all its numerous phenomena, rather than to pass them by with a shrug because they appear so intricately blended together. I doubt whether it is yet possible to give any full analysis of the variations in lepidopterous larvæ, but the following summary of the principal of those which have come under my notice may be found useful.

(1.) *Phytophagic variations*.—*a. Boarmia dejectaria*, larva light pea-green on *Melictylus*, dark brown on *Metrosideros*, and bluish grey on *Solanum*; *B. panagrata*, larva dull olive-green on *Piper*, brownish on *Aristotelia*, and presenting a third variety on *Myrtus* (G. V. Hudson, Entom. xx. 195). These *Boarmia* larvæ, found in New Zealand, resemble in colour their respective food-plants. *b. Spilosoma lubricipeda*, larvæ fed on *Aconitum* were almost black (G. S. Gregson, Young Nat., 1886, p. 192). *c. Samia cecropia*, the lateral tubercles of the larva often display a beautiful pearl colour, in the case of those feeding on *Prunus domestica* (T. G. Gentry, Canad. Ent., 1877, p. 49). *d. Lycæna comyntas*, larvæ fed on *Desmodium marilandicum* were emerald-green with yellow points, while those fed on clover were russet varying to vinous, interspersed with green (W. H. Edwards, Canad. Ent., 1876, p. 205). In many cases of phytophagic variation in larvæ, as also in perfect insects, it is quite possible that the juices of the food-plant may have an immediate effect in producing the colours we see. The dark colour of the elytra of certain beetles, for instance, has been attributed to tannin, and tannin was even found in the tissues of the species in question. Nevertheless, it seems to be established beyond a question that some larvæ, and especially newly-formed pupæ, have a chameleon-like power of

approximating their colour to that of their surroundings. Larvæ of *Catocala nupta* found wild on bark were dark, but others kept in flannel became light; larvæ of *Biston hirtaria* kept in earthenware pans were red-brown, while those found on lime leaves were green. A green one turned red-brown in process of preservation as soon as heated (H. M. Golding-Bird, Entom. xi. 109). It has even been stated that certain larvæ are able to change their colour in the course of a few moments, but I have not found any satisfactory evidence that this is the case. It would appear, rather, that the acquisition of a colour like that of the surroundings is a gradual process, and quite involuntary on the part of the larva. In Buckler's admirable work on the larvæ of butterflies, a very interesting case is recorded in which larvæ of *Vanessa cardui* found on *Malva* developed hairs. In the United States the larvæ of this butterfly are said sometimes to occur on sunflower and hollyhock, but I have not heard whether these differ in any way from the thistle-feeding form. *V. cardui* larvæ found here (Wet Mountain Valley, Colorado, 8000 feet alt.) on *Cnicus ochrocentrus*, Gray, do not differ markedly from the usual form; but I have only found them on the thistles.

(2.) *Seasonal variation*.—Such variation as there may be of a seasonal character exhibited by larvæ is probably more due to the nature of the food-plant than to the direct influence of temperature, &c., upon the larvæ. Mr. W. H. Edwards (Can. Ent., 1878, p. 5) remarks that the summer larvæ of *Lycæna pseudargiolus*, feeding on *Cimicifuga*, are white, and of the colour of their food; whereas in the autumn, feeding on a yellow flower, they are dusky and green. Lepidopterists in England are very familiar with the varieties of the larva of *Smerinthus populi*, which are more or less spotted with red, and there can be no doubt that these occur more abundantly at certain times and places than at others, although the laws governing these occurrences seem to be unknown. *S. myops*, an American species, presents a similar variation in its larva; and according to G. W. Peck (Can. Ent., 1876, p. 239), the larvæ showing red blotches are more prevalent in the late brood.

(3.) *Sexual variation*.—Secondary sexual characters in larvæ seem to be unknown, as might be expected. The larvæ of *Thyreus abbotii* vary from dirty yellowish to reddish brown, and those larvæ with uniform brown mottling were supposed to be females. But C. P. Whitney (Can. Ent., 1876, p. 76) bred some males from the supposed male larvæ, and the idea of colour indicating sex in this instance has now been given up. When larvæ have insufficient food they are smaller than usual, and it is said that such larvæ produce a preponderance of males, but this is of course the direct result of environment. In *Attacus* the sexes can sometimes be distinguished in the larval state by a dark blotch on the under side of the last segment that bears stigmata.

If truly a sexual character, this is doubtless a primary one, and Mr. E. B. Poulton has suggested that it represents the blind termination of the ducts of the sexual glands.

(4.) *Geographical variation*.—The typical larva of *Ceratonia quadricornis*, according to W. V. Andrews (Can. Ent., 1876, p. 40), is green, while a more exceptional form is deep brown. But at Rochester, in New York State, the brown variety is the prevalent one, and the green, so-called, type the exception (Can. Ent., 1876, p. 120). In Britain, the typical larva of *Vanessa atalanta* is grey-green, while black and also dingy white forms occur. But at Coalburgh, in America, Mr. W. H. Edwards found that nearly all the larvæ of *atalanta* were black in the last stage, with the lateral stripe usually macular, and greenish yellow. A small percentage was yellowish green, and a few were mottled black and yellow, but the dingy white form was not to be found (Can. Ent., 1882). Other such cases have been recorded, but it is to be noted that generally the variation is rather in the *proportions* in which certain forms occur, than in their actual occurrence. In cases where the larva presented any noteworthy difference in different regions, the perfect insects have also generally been distinguishable, and the two forms have been regarded as distinct species. Such, for instance, are *Papilio rutulus* and *turnus*, and *Pieris napi* and *oleracea*. Possibly, when larvæ are further studied, specific characters based on larval differences will in many cases prove fallacious, owing to the fact that the larvæ are far more variable and intergrading than has been supposed.

(5.) "*Spontaneous*" variation.—I apply this term to those variations which appear to occur without reference to external conditions, and which are possibly to be traced to some ancestral tendencies, the cause of which is either now obscured or lost sight of. Yet in contemplating the frequent colour-changes of larvæ, and especially the light and dark or green and brown forms of certain species, it is impossible not to think that after all these peculiar variations of colour may simply be due to the instability of the colouring-matter, and its readiness to assume new forms under influences so slight that we have not yet appreciated them. And, indeed, as stated above, a green larva of *Biston* turned red-brown on the application of heat, this being the normal colour of another variety of the same species. To enumerate all the recorded "spontaneous" variations of larvæ would be a gigantic task, but the following may serve as examples:—*Papilio ajax*, larva varies in ground colour from dark smoky brown to grey, blue-green and pale green, each form with peculiar markings. *Vanessa gonerilla*, larva varies considerably (see Entom. xvi. 218). *Deilephila spinifascia*, four vars. of larva are described (Ent. Mo. Mag., 1881, p. 132). *Philampelus achemon*, larva varies from green to pale straw or reddish brown. *Sphinx quinquemaculata*, larva

varies in ground colour from bright green to dark green, dark brown, blackish green, or even black. *Dilophonota ello*, larva varies from green to brown. *Spilosoma lubricipeda*, larva; a. *pallescens*, whitish, with grey hairs; b. *rufescens*, yellowish, with red-brown hairs; the grey variety exists in the proportion of four to one red (E. Birchall, Entom. xi. 77). *Hyphantria cunea*, Prof. Riley (Bull. 10, U. S. Dept. Agr., Ent. Div., 1887) figures varieties of the larva of this desiructive species, and says, "Close observations have failed to show that different food produces changes in the coloration; in fact, nearly all the various colour-varieties may be found upon the same tree; the fall generation is, however, on the whole, darker, with browner hairs, than the spring generation." *Cucullia chamomillæ*, Mr. Tugwell has recorded varieties ranging from white to pink. *Catocala polygama*, four forms of larva are described by W. Saunders (Can. Ent., 1876, p. 74). *Eupithecia*; the remarkable variation in the larvæ of this genus can be seen by reference to Newman's 'British Moths,' pp. 120-153. Finally, it is to be noted that sometimes very different-looking larvæ will produce nearly similar moths, a phenomenon observed in *Acronycta* and *Datana*. Mr. A. R. Grote has some interesting remarks on this subject, 'Can. Ent.,' 1877, p. 209, where he says, "There is proof in the excessive variation in the larvæ of a genus where the adults are remarkably uniform in colour and ornamentation, that the larva submits to independent and wide modification from the circumstances of its environment."

ERRATA, &c.—P. 55, line 18 from top, for "Entom. x." read "Entom. xx." *Cirrhædia æ. obscura* (p. 55) and *Acronycta t. fasciata* (p. 99) appear to be practically identical with the varieties *unicolor*, Stgr., and *virga*, Tutt, respectively. Mr. W. H. Edwards informs me that the black form of *Lycana comyntas* (p. 128) is not in the male, the black male *pseudargiolus* being the only such case known to him. Dr. John Hamilton finds that the dark forms of *Ips fasciatus* (p. 129) are not confined to the vernal brood, as was supposed.*

(To be continued.)

DEILEPHILA GALII, WITH REMARKS ON FORCING PUPÆ.

By J. ARKLE.

"By all means force *all* your *galii* pupæ." Such was the unanimous advice which followed my inquiries on the point. To the fortunate possessor of a hothouse this is easy enough; but to collectors like myself, who are less enviously placed, the

* Dr. Hamilton writes, "*Ips fasciatus* varies in colour, from all black on the elytra, to nearly all yellow. About half a dozen of the forms have received names. . . . All hatched from the same batch of eggs, perhaps" (*in litt.*, April 24, 1889).

matter, after all, is one that presents little difficulty. I am indebted to Mr. McRae, of Bournemouth, for the following plan, which I have tried; and as that gentleman kindly gives me permission to publish it, I feel I cannot do better than give it in his own words. "Procure," he says, "a large flower-pot saucer, filling it with alternate layers of coarse sand, or gravel, and moss, placing the pupæ on the top, and then covering them with a layer of moss. Saturate the whole with tepid water, and over the whole place a bell-glass. Then place the apparatus in front of the kitchen fire, and inside the fender. Place a few twigs on the top of the outside layer of moss, to enable the insects to crawl up and to dry their wings, otherwise *all* will be crippled, as the glass is too smooth for climbing. Emergence may be expected to take place in about three weeks. The temperature will often rise to at least 100° F., and, provided the whole is kept sufficiently moist, and shaded from direct radiation by placing a piece of thick brown paper in front of the bell-glass, this heat will not injure the pupæ; on the contrary, it accelerates development. By planting a piece of board behind the incubator to break the draught of cool air from the door, I often had the bell-glass so hot that I could not place my hand against it. The essential principle of forcing or accelerating emergence is *heat*, and pupæ will stand almost any amount provided they are kept *moist*." "I do not find," continues Mr. McRae, "that the fire going out at night injures the development of the pupæ in the least. There is no such thing as a uniform temperature in Nature, and the range between the maximum and minimum in twenty-four hours, at midsummer, is so considerable that I concluded I need not trouble myself about attempting to keep up a regular and fixed temperature."

This plan has been long known and practised, so Mr. McRae informs me, by the older entomologists, and he adds that it was communicated to him, some twenty years ago, by the late Mr. Edward Newman.

My captures of *D. galii* larvæ ended last season on the 13th of September. Cold and frosty weather set in shortly after, with the result that one of the caterpillars failed to pupate. Still I found myself in possession of twelve healthy-looking pupæ. Some of my correspondents began the forcing process immediately after pupation, and, judging from their results, they were by far the most successful. I, on the contrary, kept mine simply under cover. They were left in the breeding-cage exactly as they had been formed,—slightly below the surface of the sea-sand, but covered by the usual open-below sandy web or shield, and exposed only to the natural dampness of the sand.

On January 1st I examined the pupæ and found five dead and mouldy, so I at once began the use of the saucer, bell-glass, &c.

On the 7th I added three pupæ of *Smerinthus tiliæ* to the seven *Deilephila galii*, placing the apparatus on a kitchen shelf, where the maximum temperature was 70°. The first *galii* appeared on February 10th. On and about the 17th the weather was very warm for the season, and two more fine *galii* emerged at mid-day on that date. In spite of the succeeding cold, the first *S. tiliæ* appeared on the 24th. Although the cold weather continued, I began to be surprised at the non-appearance of moths between the last-mentioned date and March 7th, and upon again examining the pupæ I found two more *galii*, dead and covered with mould or white fungus. I then commenced to carry out fully Mr. McRae's instructions, taking care to keep the saucer on a level with the lower part of the fire-grate. The fourth *galii* developed on the 8th, and the fifth and last on the 26th of the month. In the meantime the second *S. tiliæ* emerged on the 8th, and the third on the 21st March.*

These remarks would possess, perhaps, greater completeness were evidence added from collectors who decided to keep their pupæ till July or August, waiting for possible emergence through natural influences. Had my stock of pupæ suffered less, I intended reserving a few for this experiment. I must therefore rest in the hope that the experience of others may, in time, be forthcoming. I need hardly add that a thorough knowledge of the habits of this insect, and its conduct when exposed to a climate very different to that of the Continent, must go far towards the settlement of what has been, perhaps, too long surrounded by doubt and controversy.

2, George Street, Chester, June 10, 1889.

CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.

By J. W. TUTT, F.E.S.

(Continued from p. 182.)

Luperina, Bdv., *cespitis*, Fab.

The type of this species is described by Fabricius in his 'Mantissa,' p. 156, No. 148, as:—"Noctua cristata, alis incumbentibus fuscis: strigis tribus undatis albidis nigræ innatis, posticis albis." "Media. Caput et thorax fusca, immaculata. Alæ anticæ fuscæ nitidulæ strigis tribus undatis pallidis, unica ante medium, duabus pone medium, quæ interne terminantur striga atra. In medio maculæ ordinariæ annulo albo. Posticæ

* Of five larvæ of *D. galii* sent me last autumn by a correspondent at Liverpool, only three attained the proper stage. These three pupæ were kept indoors, but no attempt was made to force the imagines. On the 26th of July a male specimen emerged, and a female on the 28th.—R. S.

albæ margine interdum fuscescente." Hübner figures (428) *cespitis* as "brown with a reddish tinge; a pale abbreviated, followed by a complete basal, streak, outlined in black; stigmata outlined in yellowish; a pale wavy line beyond the reniform, edged externally with black; another pale transverse line parallel to hind margin. Hind wings dark grey, base paler, a pale line parallel to hind margin." There appears to be a little variation in size. I have some specimens from South Wales much larger than some from Lancashire and Sussex. There is also a slight sexual variation, the hind wings of the female being darker than those of the male. The hind wings of the male vary in colour, as noticed by Newman in his 'British Moths,' pp. 297, 298:—"The hind wings of the male are very pale, almost white, sometimes with one, sometimes with two darker bars, parallel with the hind margin: in some specimens I find scarcely any trace of these bars."

Var. *confinis*, St.?—In Humphrey and Westwood's 'British Moths' (vol. i. p. 111) we read:—"Mr. Stephens in his 'Catalogue' regarded as a doubtful variety of this species a unique specimen obtained from the Marshamian collection, which in his 'Illustrations' he described as distinct, under the name of *Chareas confinis*, which differs from the foregoing (*cespitis*) in the paler colour and narrowness of the fore wings, nearly uniformly coloured hind wings, and slightly pectinated antennæ."

Luperina, Bdv., *testacea*, Hb.

The type of this most variable species is figured by Hübner in his 'Schmetterlinge, &c.,' fig. 139. It has the "anterior wings of a very deep (for this species) brown, with a dark outer margin, and clouded with darker around and under the stigmata. The mark, on which Haworth named his varieties, not complete. Hind wings white, lunule clearly marked, with a clouded hind margin." Hübner's type has a central band almost as in Newman's 'British Moths,' p. 296, fig. 1, but has the outer margin darker, and a shade on the outer margin of the inferior wings. This common species varies very much throughout Britain. I have specimens of a clear whitish grey colour, with scarcely a trace of typical markings (var. *obsoleta*), and other extreme forms almost black (var. *nigrescens*). The specimens from the coast districts of Lancashire, and the neighbourhood of Deal and Sligo, sometimes show a great tendency to melanism. The markings also are very variable. Some specimens have a distinct, dark, central band, others have no trace of it. On the hind wings, too, our specimens rarely have the lunule well-marked. In Britain the specimens are not generally brown, although a certain percentage are; grey is the prevailing colour, differing greatly, however, in intensity in different specimens. The Hartlepool specimens are, as a rule, much browner than those I have from any other locality. One specimen from this locality, captured by Mr. Robson, has the nervures of the anterior wings much dusted with

white, giving it a peculiar appearance. I have also seen very brown specimens from Barnsley. Haworth named three forms of this species, and Guenée described two others besides the type. There is but little doubt that the *guenéei* of Newman's 'British Moths,' p. 297, is only an extreme variety of this species. Haworth's three varieties are all based on the character of the mark, which joins the transverse lines, and which is situated directly under the stigmata. The form in which this mark is absent he calls *lunato-strigata*, from the lunar mark in connection with the outer striga being the principal character; the form in which this mark is a simple hook he calls *unca*, and in that in which it forms an χ -like mark he calls χ -*notata*. The following, therefore, is an attempt to tabulate the named varieties:—

1. Var. *obsoleta*.—Pale greyish white, with no darker markings whatever.

2. Var. *guenéei*.—Pale greyish white, some of the markings indistinct.

3. Var. *cinerea*.—Ashy grey, with distinct markings.

4. Var. *nigrescens*.—Blackish grey, with indistinct markings.

5. The type.—Brownish or brownish grey, with well-developed central band.

6. Var. *lunato-strigata*.—Greyish, tinged with reddish or brown; striga beyond reniform composed of lunules, but no mark under stigmata.

7. Var. *unca*.—Greyish, tinged with red or brown; longitudinal hook-shaped mark under stigmata.

8. Var. χ -*notata*.—Like *unca*, but the longitudinal mark χ -shaped.

a. var. obsoleta, mihi.—Of a pale ochreous-grey colour, with all the lines, markings and stigmata still paler. This is an extreme pale unicolorous form, and seems excessively rare. I have specimens taken in Deal, and Mr. Percy Russ has sent it to me from Sligo; I have also a specimen closely resembling this obsolete form from Mr. Robson, at Hartlepool; and Mr. Porritt, writing to me some time since, states, "A pale yellowish form occurs near Huddersfield" (*in litt.*).

β. var. guenéei, Dbdy.—There does not seem to be the slightest doubt that this is anything but a variety of *testacea* of an extremely pale ground colour, as in var. *obsoleta*, but differing from that variety in having most of the characteristic markings of *testacea* rather more distinctly marked, owing to the paler ground colour; otherwise there appears to be no difference—certainly no specific difference—between the variety and *testacea*. The original description of Mr. Doubleday is transcribed *verbatim* into Newman's 'British Moths' (p. 297), together with notes on its occurrence. Mr. Doubleday writes that Guenée stated it to be his var. A ('Noctuelles,' vol. v., p. 182). If properly worked, I believe *testacea* would in many districts furnish a fair proportion of *guenéei*. Staudinger, in his List, says of it, "Al. ant. unicolor, nigro alboque irroratis." Mr. Vine, of Brighton, sent me a specimen of the genus *Luperina* to look at a short time since, about which he wrote:—"I beat out a *Luperina* from a black-

thorn bush in Abbott's Wood, which I think is *guenéei*." It is, I think, undoubtedly this variety, but it is exceedingly small* (scarcely larger than *Miana strigilis*), very pale grey, with a few very indistinct black costal markings, all the markings of *testacea* faintly marked, the three stigmata traceable although indistinct. Hind wings pale grey. The history of the original *guenéei* may be found in the 'Entomologist,' vol. xviii., p. 54.

γ. var. *cinerea*, mihi.—I have given this name to Guenée's var. β., a not uncommon form in Britain. Guenée thus describes it:—"Superior wings of an ashy-grey, with a slight reddish tinge. The transverse lines indistinct, the basal one having the points at the lower part very pointed. The terminal space edged by a series of blackish streaks, which are placed between the nervures. Inferior wings very pure white, with an indistinct shade. Locality, the Eastern Pyrenees." "This is very different to our *testacea*, but M. de Graslin, who has reared it from the larva, and who is better able to recognize any variation in all its stages than myself, considers it a simple variety" ('Noctuelles,' vol. v., p. 283). This grey form is probably the most common one in Britain; I have it from Sligo, Lancashire, Hartlepool, Aberdeen, Strood, Deal, London, and other localities.

δ. var. *nigrescens*, mihi.—Anterior wings blackish grey, varying in intensity. The markings too vary, some having them darker than the ground colour, while others have them so nearly of the same hue as to make the specimens look almost unicolorous. I have specimens in my cabinet from Sligo, Aberdeen, Fleetwood, and Strood. A black specimen is also recorded (Entom. vol. iv., p. 305) as being captured at St. Ives, Hunts; and Mr. Robson informs me that it occurs at Hartlepool. Mr. C. G. Barrett, 'Ent. Mo. Mag.' vol. xxii., p. 124, writing of this species at Belfast, says, "Several of the *L. testacea* were nearly black"; whilst at p. 188 of the same volume, we read that Mr. Porritt exhibited at the London Society's meeting a melanic specimen from Glasgow.

ι. var. *lunato-strigata*, Haw.—Haworth's type of this variety is described by him as follows:—"Noctua. Alis rufescentibus nigro nebulosis, strigis duabus fasciæque marginali fuscis." "Præcedenti vix differt nisi magnitudine minore, et coloribus saturatoribus, sed rarissime variat" ('Lepidoptera Britannica,' p. 194, No. 97). This form, without the mark under the stigmata, is not uncommon in most localities.

ζ. var. *unca*, Haw.—Haworth's type of this variety is described as follows:—"Alis pallide rufescentibus strigis duabus fasciæque marginali fusciscentibus." "Alæ anticæ subnebulosæ, striga undata fracta ante medium: tunc stigmata ordinaria fusco pallidoque imperfecte marginata: tunc striga secunda extus arcuata, ex lunulis confertis nigris pallido extus adnatis composita; et priore fascia connexa per lineolam nigram unciferam. Margo posticus undatim subfuscus apice pallido. Cilia rufo-cinerea maculis cinereo-fuscis. Posticæ albæ striga in ipso margine subinterrupta fusca, ciliis rufescentibus" ('Lepidoptera Britannica,' p. 194, No. 96). This form, with a simple curved or hooked lineola, joining the transverse lines and extending under the stigmata, is one of our most common varieties.

η. var. *χ-notata*, Haw. Haworth's description of this variety is:—"Alis rufescentibus macula oblonga nigra utrinque emarginata in medio, strigæque arcuata pone medium et lunulis nigris." "Præcedenti valde

* It is worthy of note that Mr. Gregson, 'Entomologist,' vol. iv., p. 51, writes of this species, "I possess specimens from less than 1 inch to 1 inch 4 lines in expansion."

affinis (lunato-strigata), at magis rufescens. Antennæ hirtectopectinatæ ut in illa, at macula media nigra diversa est. Alæ posticæ albæ, apice strigaeque in ipso margine fulvis." Another not uncommon form, with the mark under the stigmata somewhat χ -shaped; this is due to the neatness with which the two transverse strigæ approach each other under the stigmata.

MAMESTRA, Och.

With regard to the genus *Mamestra*, most of the species have two extreme forms of variation,—one, pale brownish grey; the other, black, with almost all intermediate forms. *Sordida (anceps)* seems to be the extreme ochreous type of the genus, *persicariæ* the extreme black one. Based on variation, the position of *furva* seems somewhat anomalous, and it seems to me that this species should hardly be placed in this restricted genus at all. With regard to the other species, *abjecta* has two extreme forms, so has *albicolon* (Guenée's 'Noctuelles,' vol. v., pp. 194 and 196), but we do not apparently get the darkest forms of the latter species in Britain, though there is a great deal of variation in our specimens, and *brassicæ* has also two extreme forms. With regard to another phase of variation in this genus, a careful selection of varieties shows that the *albicolon* mark, supposed to be characteristic of one species, is really well-developed in aberrant members of all the other species, the only species in which it is not traceable being in *persicariæ*, but my series of the latter does not contain specimens of those varieties in which the reniform is more or less obsolete, and it is in such I should expect to find it.

Mamestra, Och., *abjecta*, Hb.

The type of this species is represented by Hübner's fig. 539, 'Schmet. von Europa,' which may be described as having—"Anterior wings of deep, but clear, brownish (almost reddish) grey, an abbreviated basal transverse line and a complete one in contact with the inner edge of orbicular, both double; a short dark longitudinal streak under base of median nervure; orbicular distinct, reniform outlined in white; an oblique line from costa to median nervure between stigmata; a wavy transverse line just beyond reniform, followed by four short longitudinal wedge-shaped spots. The dark longitudinal mark under stigmata in Newman's figure ('British Moths,' p. 298) is absent. The hind wings dark grey on outer edge, with pale base and distinct lunule." Staudinger says "forma, al. ant. fere unicolor magis nigris." I rather fail to follow how Staudinger can call Hübner's figure "almost unicolorous"; it certainly is much more variegated than many specimens we get, as the above description clearly shows, but apparently much less so than the ordinary continental form which he has named *variegata*. The most unicolorous *ms* that I have seen are (1) a fine steely grey form from the

coast of Lancashire, var. *fribolus*; (2) a fine black form from North Kent, var. *nigro-distincta*; and (3) an ochreous grey form, var. *unicolor*. Some of my specimens much resemble Hübner's type (although I have never seen a British specimen exactly like it), others are like Newman's figure, besides the unicolorous forms. There is really very little doubt that this species is in reality polymorphic, closely resembling its near allies, the genus *Apamea*, in this respect. It would be impossible to classify the different forms except in a most general way. Guenée does so by classifying them into those with ground colour "grey-brown," and those with ground colour "grey-black." He writes:—"This species offers, like *albicolon*, two varieties: one of a grey-brown and one of a grey-black. The first is the type of Hübner. The markings are rarely so well marked as in the figure of that author." Guenée then divides the form with a black ground colour into two varieties, the *fribolus* of Boisduval, an almost unicolorous blackish form, and var. B, a black form with the markings more distinct. The *lunulina* of Haworth agrees pretty correctly with Hübner's type. His summarised description is:—"Noctua alis fuscis strigis lunularum pallidarum" ('Lepidoptera Britannica,' p. 192, No. 92). We thus get the following forms:—

1. Anterior wings much variegated with black and white markings, = var. *variegata*, Stdg.
2. Brownish-grey ground colour, with distinct markings, = *abjecta*, Hb.
3. Ochreous or brownish grey, with no markings, = var. *unicolor*.
4. Blackish grey, with distinct markings, = var. *nigro-distincta*.
5. Deep greyish black, with indistinct markings, = var. *fribolus*, Bdv., = *nigricans*, Freyer.

α. var. *variegata*, Stdgr.—Staudinger's description of this variety is as follows:—"Al. ant. thoraceque albido nigroque variis." I do not think many of our specimens have much white about them. The most variegated British specimen I have seen belongs to Mr. Robson, and was captured near Hartlepool. This is much irrorated with whitish scales, and variegated with black; I have one from Shoeburyness less strongly marked. I would include all grey or brown, irrorated and variegated specimens under this name.

β. var. *unicolor*, mihi.—Anterior wings of a brownish grey colour, with an ochreous tinge, and with no distinct markings. This is our more general unicolorous form, and is much more frequent than the blackish grey unicolorous variety. On the east coast it is the form more often met with than any other. I have it from Strood, the neighbourhood of Hull, Shoeburyness; and a series that I have looked over, taken by Mr. Robson at Hartlepool, belong principally to this form.

γ. var. *nigro-distincta*, mihi.—This is Guenée's var. B., which he

describes as follows :—" Similarly (to var. *fribolus*) of a greyish black. All the markings clearly written. Inferior wings with the outer margin more deeply marked, and a more distinct lunule " ('Noctuelles,' vol. v., p. 194). Guenée treats this only as a North American variety, giving the State of New York and Canada as localities. I have specimens of this form only from Greenwich and the neighbourhood of Cliffe (Kent); but although those from the latter locality are well marked, they scarcely appear so, owing to the intense depth of the ground colour.

♂. var. *fribolus*, Bdv.—This is the *nigricans* of Freyer. Guenée's description is :—" Superior wings of a deep greyish black." Same localities as type. I would include all unicolorous, greyish black forms under this name. I have specimens from Shoeburyness, Deal, near Cliffe, and Fleetwood. There appears to be no doubt that the steel-grey Lancashire specimens must be included under this varietal name.

(To be continued.)

ZYGÆNA PILOSELLÆ IN WALES.

By CHARLES OLDHAM.

In the second week of June, when visiting the locality where I took this species in 1887, as recorded by Mr. Samuels in the 'Entomologist' for August of that year, I found it on the sunny slopes above the cliffs by hundreds, flying just above the ground in the bright sunshine in its characteristic fashion, and frequently settling on the grass blades. So plentiful was it that a friend and I were able to capture about fifty specimens in a few minutes, without a net, merely picking them from the grass with our hands. The insects were, however, limited to certain patches of cliff, perhaps not twenty yards in length, where they swarmed; and between these favoured spots you might walk for several hundred yards without seeing a single moth. This restriction appeared to have no relation to the distribution of the food-plant (bird's-foot trefoil), which was in flower everywhere.

The insects belong to the hairy-bodied variety *nubigena* (Led.), which Kirby says ('European Butterflies and Moths') "is the ordinary *minos* of British collectors," and they are identical with examples I have from an Irish locality.

Ashton-on-Mersey, July 12, 1889.

ENTOMOLOGICAL NOTES, CAPTURES, &c.

EUCHLOË CARDAMINES, DWARF FORM.—On May 22nd last, whilst insect-hunting in Epping Forest, I took a very small male of this species hovering over the flowers of the wood parsley (*Anthriscus sylvestris*). The insect is barely $1\frac{1}{2}$ inch in expanse.—JAMES A. SIMES; 4, Cricketfield Road, July 17, 1889.

VANESSA CARDUI IN JAVA.—I have recently seen a considerable number of these butterflies at and near Lindanglaya, about forty miles from here. Judging from memory they are exactly the same as in England, and certainly haunt similar places, namely, open stony roads. They first occur at about 1500 feet above the sea-level, and I noticed them up to about 4000 feet. There the road entered the forest, else doubtless they would have occurred still higher. In Bombay, some years ago, I used to see a great many; there they occur close to the sea, and at that level. I know *V. cardui* is a very widely distributed species; but is it usual to find it so near the equator as Java?—T. E. SANSOM; Koningsplein, Batavia.

LYCÆNA ICARUS, HERMAPHRODITE.—On June 22nd I was with Mr. T. Brown, collecting on his farm at Keyingham, South-east Yorkshire, when he caught a specimen of *L. icarus* with the right wings blue, as of the males, and the left wings brown and spotted, like the females.—J. W. BOULT; 17, Finsbury Grove, Fountain Road, Hull, July 6, 1889.

POLYOMMATUS PHLÆAS var. SCHMIDTII.—At a meeting of the North Kent Entomological Society, on June 20th, a splendid specimen of the above variety was exhibited by Mr. W. G. Dawson, which had the whole of the copper colour replaced by a beautiful white silvery sheen. The insect was captured a few days previously on Plumstead Common.—H. F. WEBB; 3, Gunning Street, Plumstead.

RHOPALOCERA IN KENT.—I captured a magnificent specimen of *Colias edusa* on the wing, on June 9th, in the chalk-pit at Kemsing, near Seven-oaks, and have heard of two being seen since. I have never taken one before July, though I have been a collector for many years. In the Kemsing district I captured, from May 12th to June 12th, twenty-four different species of butterflies, and a large number of moths—chiefly Geometridæ. They were mostly out much earlier than usual.—CECIL G. STOKOE; The Rectory, Lutterworth, June 28, 1889.

DEILEPHILA GALII IN CHESHIRE.—I have been informed of the capture this year of two fine specimens of *D. galii*, in this neighbourhood. They appeared to be fresh from the chrysalis.—J. ARKLE; 2, George Street, Chester, July 9, 1889.

DEILEPHILA GALII IN KENT.—Last year I found in this neighbourhood two caterpillars of *D. galii* and one of *C. elpenor*. The moths have now emerged, and are without defect.—W. NORTH BUCKMASTER; West Cliff Road, Ramsgate, June, 1889.

SESIA ANDRENIFORMIS AT DOVER.—It will interest the readers of 'The Entomologist' to know that I had the pleasure of taking a fine male *Sesia andreniformis* on July 10th, and another male on July 14th; but I had the misfortune of missing a female on July 14th. Mr. S. Webb was kind enough to identify them for me.—W. DAVIS; 27, Winchelsea Street, Dover, July 16, 1889.

SESIA ICHNEUMONIFORMIS IN GLOUCESTERSHIRE.—On Wednesday, July 17th, while walking along the Gloucester and Berkeley Canal, I saw a male and female of this rather uncommon insect *in copulâ*, settled on the bank. I had only a pocket net with me, but managed to secure them. I placed them both in a box covered with muslin, with pieces of sponge

dipped in syrup, and exposed them on a window-ledge; but much to my disappointment I did not get any ova. I have never taken this insect before in Gloucestershire.—M. STANGER HIGGS; The Mill House, Upton St. Leonard's, Gloucester. [The better way would have been to have placed the female in a covered flower-pot containing growing plants of *Lotus corniculatus*, in the root-stem of which the larvæ feed.—J. T. C.]

ARCTIA URTICÆ IN BRIGHTON.—On the evening of May 26th I took a fresh specimen of *A. urticæ* on a lamp-post in the Preston Road. The only locality mentioned for it in 'The List of Macro-Lepidoptera of East Sussex' is Lewes Marshes.—HENRY G. PLACE; 53, Buckingham Road, Brighton.

STAUROPOUS FAGI IN FOREST OF DEAN.—On June 12th I found a newly-emerged male *Stauropus fagi* on an oak in the Forest of Dean. I mention the fact as I have not seen its capture recorded in this locality before.—N. F. SEARANCEKE; Mitcheldean.

CARADRINA QUADRIPUNCTA.—I should think Mr. J. W. Tutt is quite correct (Entom. 187) in his conjecture as to this insect appearing all the year round. On referring to my diaries I find I have taken the insect every month of various years, but find it the rarest in April. In the winter months, say from November to March, it is commonly taken in perfectly fresh condition, in the stables here, by the groom, and brought to me as "something new this time."—A. E. HALL; Norbury, Sheffield, July, 1889.

GEOMETRA VERNARIA, VAR.—I have taken a variety of *G. vernaria*, pale salmon-colour, with the green tint showing in a dash on the two under wings only.—G. M. A. HEWETT; 3, St. Swithin Street, London. [Probably the result of moisture acting on the fugitive green colour.—ED.]

TRIFURCULA PALLIDELLA.—It is ten years since I took a male specimen of this rarity. Yesterday I was fortunate to take a fine female at Dutton. What a queer looking insect! The cilia are more like bristles than feathers; they look like a lot of short hairs. This sex is of a more bronze colour than the male.—J. B. HODGKINSON; Ashton-on-Ribble.

SUGAR UNPRODUCTIVE.—I regret to say sugaring has been very unproductive here all this month, and from the beginning of June, doubtless owing to the cold which always seems to follow sunset.—ALBERT J. HODGES; Elgin Cottage, Freshwater Bay, Isle of Wight, July 13, 1889.

FURTHER NOTES ON THE LEPIDOPTERA OF WIMBLEDON.—Having at one period of my life spent many hours in the pursuit of insects on and near Wimbledon Common, I venture to add a few names to the interesting list of species captured by Mr. Whittle (Entom. 150). I am looking back to a much earlier date, probably, than that to which Mr. Whittle is referring, and some species I used to take have very likely disappeared, or become much scarcer. Longer ago still, in the days of the earlier entomologists, it is enough to make one's mouth water to read of the things they used to take in Wimbledon Park and Coombe Wood, both adjacent localities to the Common: the former of these has long been cut up for building, and the latter seems now about to follow suit. However, while Wimbledon Common is preserved as an open space, and allowed to retain—in part at

least—its native wildness, it will be the home of some good insects. I am sorry that I cannot give the exact dates, but my note-books have been destroyed; the time would be between 1867 and 1872. *Argynnis euphrosyne* and *selenis*; the former of these was observable on the Common most years, breeding, no doubt, in the wood close by; of the latter species I got battered specimens in 1868,—probably it had a habitat also in the Wood, but it may have since died out, and the other also. *Vanessa cardui* occurred in lanes near the Common, sparingly, in 1868 and 1869; only the autumn brood was seen. *Hesperia malva*, tolerably abundant some seasons in marshy places, but appeared on the wing for a very brief period. *Macroglossa stellatarum*, occasionally seen on the Putney side of Wimbledon Common; larvæ were formerly not uncommon along the margin of the Thames, feeding on *Galium*. *Sesia formicæformis* was formerly taken amongst willows. *Dieranura furcula*, a few larvæ on the black poplar in August and September. *Trichiura cratægi*, once taken; it has also been captured by other collectors occasionally. *Gastropacha quercifolia*, some specimens taken on the rough ground south of the Butts, several years, and shown me subsequently, but I never captured it. *Liparis chrysorrhæa*: imago and larvæ in hedges, 1867. *Euplexia lucipara*: larvæ beaten from various plants. *Cerigo cytherea*, occasionally found on trunks of trees. *Teniocampa munda* used to be found in the Park, also on the Common amongst low plants, but somewhat unaccountably it became scarce. *Cucullia chamomilla*, some specimens on the palings to the east of the Common; I searched in vain for the larvæ, at the suitable time, on its usual food-plant. *Xanthia cerago*, beaten in small numbers during the autumn, out of mixed hedges. *Euclidia mi*, occasionally flying by day. *Ennomos angularia*: larvæ on various shrubs. *Hemerophila abruptaria*, at rest on fences. *Boarmia consortaria*, taken once by a friend in a riding of Coombe Wood. *Tephrosia punctulata*, not unfrequent some seasons on the Common, and in the adjacent wood. *Pseudoterpna cytisaria*, few in marshy places near the Butts. *Iodis lactearia*; imago and larvæ most years. *Ephyra pendularia*, by beating along the edge of the wood; less common than others of the family that occur here. *Asthena luteata*, a few specimens in 1870. *Acidalia bisetata*, not unfrequent on palings. *Strenia clathrata*, usually abundant. *Anisopteryx æscularia*: larvæ not uncommon on sloe. *Phibalapteryx lignata*, near Coombe Wood, occasional. *Cidaria fulvata*, very plentiful on the Common some seasons, but confined to a small extent of ground. *Eubolia mensuraria*, frequent on the east side of the Common. *Anaitis plagiata*, a few specimens taken in April or May; not observed in the autumn.—J. R. S. CLIFFORD; 4, Laurel Villas, Old Road, Gravesend, June 15, 1889.

FIRST APPEARANCE OF SEXES OF LEPIDOPTERA.—In many books I have noticed that male insects are always credited with appearing before the females, and even in the last work I perused on "Darwinism" it was again asserted that the males were the first to appear. Now as far as Lepidoptera are concerned, of which I only can speak with certainty, the females in almost every case precede the males by a day or two in my breeding-cages; and as I breed some thousands of imagines every year, and always notice the females emerge the first, and yet always read in books that the males emerge before the females, I should be very glad to have another entomologist's experience in that matter. Of course insects in

general are treated of in the one case, and Lepidoptera only in mine. The only reason I can assign for the females emerging first is, that they require a certain period to elapse before coition with the males, and hence appear before the males are ready for copulation; but that is only conjecture.—A. E. HALL; Norbury, Sheffield, July, 1889.

CICINDELA GERMANICA, Linn., IN DORSETSHIRE.—I beg to record the occurrence of this rare and local beetle lately in Dorsetshire. It appeared to be confined to a very small spot (between Bridport and Lyme Regis). I had no time to search closely for it, but picked up four fine specimens as I passed quickly over the ground, on which there were others also running about. It did not attempt to fly, though the sun was shining brightly. The Rev. W. W. Fowler ('Coleoptera of the British Islands') mentions it as recorded in Dorset by Dawson, but gives no more precise locality, and says that "Black Gang Chine (Isle of Wight) appears to be the only locality in which it is now taken." I have felt it necessary, for obvious reasons, to refrain from giving any clue to the exact spot, but shall be very happy to communicate it to any *bonâ fide* amateur coleopterist who may be in that neighbourhood and desire to search for it.—(REV.) O. PICKARD-CAMBRIDGE; Bloxworth Rectory, July 16, 1889.

NOTE ON *EPHIPPIUM THORACICUM*.—Donovan figured this fly in 1813, from a specimen taken in Coombe Wood on June 4th, 1812, by G. Milne, F.L.S., and goes on to say:—"Musca ephippium is considered to be a scarce species in this country. It is known to have been taken occasionally by the old collectors about thirty years ago, or rather more, in the woods about Highgate, which, in consequence of the recent improvements in that vicinity of the metropolis, are now demolished. It has occurred likewise in the woods of Kent. Swainson met with three specimens, at the same time, sticking against the trunks of trees: this happened about twenty years ago, and it was then esteemed a rare circumstance. The red thorax reminds me much of the solitary ant, *Mutilla europæa*. The larva frequents rotten wood." I possess three specimens, which my father purchased from the collection of the late Thomas Desvignes when it came under the hammer in 1868.—C. W. DALE; Glanville's Wootton.

SEHIRUS DUBIUS, Scop., AT HORSLEY, SURREY.—A solitary specimen of this very rare and beautiful Hemipteron, of the family Cydinidæ, was taken while at rest on a dead stem of marjoram by Mr. Carrington, while entomologizing in a rough place south of the Sheep Lees, at Horsley, on the 23rd of May last. I am indebted to Mr. Carrington, who not only very generously presented me with the specimen, but kindly conducted me and several friends over the same ground, on the occasion of the Field Excursion of the South London Entomological and Natural History Society, to Horsley, on the 22nd of last June, and, although we swept vigorously and searched diligently for some considerable time, we were doomed to disappointment, for no other specimen could be found. This being entirely a new locality for *Sehirus dubius*, I think it is worth recording, its only hitherto known localities being Pangbourne (Wollaston), Portland (Dale), and the Isle of Wight (Mr. Edward Saunders).—T. R. BILLUPS.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—*July 3rd, 1889.*—The Right Honourable Lord Walsingham, M.A., F.R.S., President, in the chair. The Rev. W. A. Hamilton (Calcutta), and Mr. H. W. Vivian (Glenafon, Taiback, South Wales), were elected Fellows of the Society. A letter was read from Mr. E. J. Atkinson, Chairman of the Trustees of the Indian Museum, Calcutta, in which assistance was asked from British entomologists in working out various orders of Indian insects. The following motion, which had previously been unanimously passed at the meeting of the Council, was read to the Society:—"That papers containing descriptions of isolated species widely remote in classification or distribution, are, as a rule, undesirable for publication, as tending to create unnecessary difficulties for faunistic or monographic workers." Mr. M'Lachlan, Mr. Jacoby, Mr. Elwes, Dr. Sharp and others took part in the discussion which followed. Mr. J. W. Slater exhibited a doubtful specimen of *Arctia mendica*, L., which appeared as if it might prove to be a hybrid between that species and *A. lubricipeda*, L. Mr. M'Lachlan, on behalf of Prof. Klapálek, of Prague, who was present as a visitor, exhibited preparations representing the life-history of *Agriotypus armatus*, Walk., showing the curious appendages of the case. Prof. Klapálek, in answer to questions, described the transformations in detail. A discussion followed, in which Mr. M'Lachlan and Lord Walsingham took part. Mr. H. J. Elwes exhibited a specimen of an undescribed *Chrysophanus*, taken in the Shan States, Upper Burmah, by Dr. Manders, which was very remarkable on account of the low elevation and latitude at which it was found; its only very near ally appeared to be *Polyommatus li*, Oberthür, from Western Szechuen, but there was no species of the genus known in the Eastern Himalayas or anywhere in the Eastern tropics. Mr. G. T. Porritt exhibited a remarkable series of *Arctia mendica*, L., bred from a small batch of eggs found on the same ground at Grimescar, Huddersfield, as the batch from which the series he had previously exhibited before the Society was bred. This year he had bred forty-five specimens, none of which were of the ordinary form of the species: as in the former case, the eggs were found perfectly wild, and the result this year was even more surprising than before. Mr. R. W. Lloyd exhibited specimens of *Harpalus cupreus*, Steph., and *Cathormiocerus socius*, Boh., recently taken at Sandown, Isle of Wight. Mr. O. E. Janson exhibited a fine male example of *Theodosia howitti*, Castelnau, a genus of Cetoniidæ resembling some of the Dynastidæ in the remarkable armature of the head and thorax. The specimen had recently been received from N.W. Borneo. Mr. W. White exhibited specimens of *Heterogynis paradoxa*, Ramb., and stated that this insect represented an extreme case of degeneration, the mature female being only slightly more developed than the larva, the prolegs being quite atrophied. Lord Walsingham made some remarks on the subject. Mr. W. Warren exhibited bred specimens of *Tortrix piceana*, L. Mr. T. R. Billups exhibited a fine series of the very rare British beetle, *Medon (Lithocharis) piceus*, Kr., taken from a heap of weeds and vegetable refuse in the neighbourhood of Lewisham on May 19th; and specimens of *Actobius signaticornis*, Rey, and *A. villosulus*, Steph., taken in company with the above. Mr. Billups also exhibited specimens of *Eulophus damicornis*, Kirby, belonging to the Chalcididæ, bred from pupæ found by Mr. Adkin attached to the leaves of lime-trees at

Oxshott, Surrey, but the host was unknown. Mr. W. F. Kirby read a paper entitled "Descriptions of new species of *Scoliidæ* in the collection of the British Museum, with occasional reference to species already known." Mr. J. B. Bridgman communicated a paper entitled "Further additions to the Rev. T. A. Marshall's Catalogue of British Ichneumonidæ." Mr. J. S. Baly communicated a paper "On new species of *Diabrotica* from South America.—W. W. FOWLER, *Hon. Sec.*

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*June 27th, 1889.*—T. R. Billups, F.E.S., President, in the chair. Mr. Joy exhibited *Bankia argentula* from Cambridge. Mr. Wellman, *Penthina pruniana*, var. *pullana*. Mr. Dennis, a variety of *Argynnis selene*, the black markings of the fore wings forming a broken band across the wings, from Ashdown Forest. Mr. Adkin, *Lobophora halterata*, bred from larvæ taken in W. Yorkshire, where it appears to be abundant. Mr. Tugwell said this was not by any means an uncommon species; he had found it in Berkshire, at Tilgate Forest, and near Hailsham; the larva was peculiarly an aspen feeder. Mr. Strong, *Scodion belgiaria*, a variety of *Bupalus piniaria*, and larvæ of *Liparis monacha*, from the New Forest. Mr. Waller, a fawn-coloured variety of *Argynnis euphrosyne*. Mr. Frohawk, some British spiders and their nests. Mr. Billups, *Eulophus damicornis*, bred from pupæ attached to the leaves of lime-trees from Oxshott: a specimen of *Schirus dubius*, taken by Mr. Carrington at Horsley, Surrey, this being a new locality for the species; also a series of *Corymbites quercus*, var. *ochropterus*, taken at Armagh, Ireland, by the Rev. W. F. Johnson. Mr. Billups also showed galls on the dead stems of nettle, and the parasite (*Torymus abdominalis*) bred from the same; the galls were found in the neighbourhood of Westerham during May, by Mr. Carrington.

July 11th, 1889.—The President in the chair. Mr. Weir exhibited a specimen of *Pararge egeria*, taken by Dr. Percy Rendall at Puerto Ventura, one of the Canaries: it was apparently the var. *xiphia*, Fab. Mr. West, of Streatham, specimens of *Cidaria dotata*, with dark-banded var. taken in his own garden. Mr. J. A. Clark, specimens of *Retinia resinella*; and Mr. Tugwell made remarks upon its curious habit of feeding and making its cocoon in resinous matter. Mr. Turner, a remarkable albino decoloration of *Melanippe fluctuata*. Mr. Adkin, *Spilosoma mendica*, var. *rustica*, bred from selected parents, the offspring largely following their respective parents; also larva and pupa of *Gonepteryx rhamni*. Mr. N. E. Warne, *Canonympha typhon* from Cumberland: it was remarked that, like most English specimens, it differed on the under side from the unicolorous Scotch forms. A discussion ensued on melanism, Messrs. Weir, Tugwell, and Slater taking part. Mr. Weir, leaves of *Urtica dioica*, with a number of dead flies attached, which were surrounded by a fungus: Mr. Billups considered they had died from an internal parasite. Mr. Billups, clusters of flies, *Anthrax ibis*, with parasites; also *Orgilus obscurator*, bred from larvæ feeding on sawfly; also *Apanteles ruficrus*, in cocoon, with remains of its host, *Diloba cæruleocephala*, and made remarks on the variety of its hosts; besides the above, *Leucania littoralis*, *Spilosoma menthastri*, *Leucania pallens*, *Collix sparsata* and *Agrotis præcox* were mentioned. Mr. Tugwell exhibited stems of *Salix repens*, with what appeared to be galls closely resembling the berries of *Vaccinium*.—H. W. BARKER, *Hon. Sec.*





see Knight ad nat.

West Newman & Co. engravers

Varieties in the Genus *Vanessa*.

THE ENTOMOLOGIST.

Vol. XXII.]

SEPTEMBER, 1889.

[No. 218.]

NOTES ON SOME ABERRATIONS IN THE GENUS *FANESSA*.

By RICHARD SOUTH, F.E.S.

(PLATE VIII.)

Fanessa c-albata, Linn., var., Pl. VIII., fig. 3 (p. 104).

Is this curious aberration, which is from Berlin, the ground colour is suffused with fuscous. On the primaries the basal black spots are confluent, and the two central ones are hardly indicated; the normal maculation of the secondaries gives place to an irregular-shaped black central patch. The under surface is blackish brown, variegated with tawny along the costa, at the apex and inner angle of primaries, and on the margin of secondaries; the central spot is wedge-shaped and acutely pointed.

Another similar variety, from Switzerland, has the first costal spot of primaries normal, whilst the second is broadly produced outwardly and unites with the third at its lower end, thus enclosing a small patch of the ground colour; the two central spots are dilated externally and unite with the marginal ones. Below, the central spot of secondaries is wedge-shaped and sharply pointed, but it has a deep indentation on its upper edge.

Both specimens are in Mr. Leech's collection.

Fanessa arctica, Linn., var., Pl. VIII., fig. 4.

" " var. *ichnusoides*, De Selas, Pl. VIII., fig. 5.

" " var. *connexa*, Butl., Pl. VIII., fig. 6.

Except that the primaries are crossed by a yellowish line, there is perhaps nothing very remarkable about the species represented by fig. 1 on the Plate. It is however interesting, because, although of German origin, it exhibits one of the chief aberrations of the genus *F. tadakensis*, Moore. This yellowish band which crosses

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Vanessidae in the Genus *Vanessa*.

THE ENTOMOLOGIST.

VOL. XXII.]

SEPTEMBER, 1889.

[No. 316.]

NOTES ON SOME ABERRATIONS IN THE GENUS *VANESSA*.

By RICHARD SOUTH, F.E.S.

(PLATE VIII.)

Vanessa c-album, Linn., var., Pl. VIII., figs. 5 and 6.

IN this curious aberration, which is from Berlin, the normal fulvous colour is suffused with fuscous. On the primaries the costal black spots are confluent, and the two central ones are hardly indicated; the normal maculation of the secondaries gives place to an irregular-shaped black central patch. The under surface is blackish brown, variegated with tawny along the costa, at the apex and inner angle of primaries, and on the margins of secondaries; the central spot is wedge-shaped and acutely pointed.

Another similar variety, from Switzerland, has the first costal spot of primaries normal, whilst the second is broadly produced outwardly and unites with the third at its lower end, thus enclosing a small patch of the ground colour; the two central spots are dilated externally and unite with the marginal border. Below, the central spot of secondaries is wedge-shaped and sharply pointed, but it has a deep indentation on its upper edge.

Both specimens are in Mr. Leech's collection.

Vanessa urticae, Linn., var., Pl. VIII., fig. 1.

„ „ var. *ichnusoides*, De Selys, Pl. VIII., fig. 2.

„ „ var. *connexa*, Butl., Pl. VIII., fig. 3.

Except that the primaries are crossed by a yellowish fascia, there is perhaps nothing very remarkable about the specimen represented by fig. 1 on the Plate. It is however interesting, because, although of German origin, it exhibits one of the chief characters of the Indian *V. ladakensis*, Moore. This yellowish band, which is the

character referred to, is found indicated more or less clearly in several specimens among the magnificent series of *V. urticae* from Europe in Mr. Leech's collection, and I have seen traces of it in British examples of the species.

Fig. 2 represents the Japanese form of *V. urticae*: this is known as *V. connexa*, Butl., and is regarded by some entomologists as a distinct species.

Var. *polaris*, Staud., from Lapland, appears to be a form intermediate between *connexa* and the type.

Vars. *turcica*, Staud., and *ichnusa*, Bon., from the Balkan Mountains, and Corsica and Sardinia respectively, are well-known local forms of *V. urticae*. The former has no yellow patch near the inner angle, and the two black spots are very small; whilst the last-named variety has neither yellow patch nor black spots above, and the wings are less angulated. Both forms are, however, subject to modification.

Ichnusoides, De Selys, Mén. Liège, ii. (1845), re-described and figured by Lambrichs, Ann. Ent. Belg. xxi. p. 9, Pl. I. fig. 5, is a form of *V. urticae* which, as regards the primaries, appears to have some of the characters both of *polaris* and *ichnusa*; but it will be seen, on referring to fig. 3, Pl. VIII., that the secondaries are curiously aberrant. The specimen now figured is from Berlin, and is in Mr. Leech's collection: it is not, however, exactly identical with the example figured by Lambrichs, as in that specimen the costal spots of primaries appear to be confluent. Under the name of *atrebatensis*, Boisduval figures another modification of var. *ichnusoides*: this has the two costal spots nearest apex of primaries confluent, the yellow normally between first and second spots only faintly indicated, and the whole insect is much suffused with blackish.

From var. *ichnusa* on the one hand to var. *connexa* on the other is a far cry; and if we had no knowledge of such intermediate forms as *ichnusoides*, *turcica* and *polaris* we might fairly consider the extreme forms distinct species: as it is, there does not appear to be any valid reason for regarding them otherwise than as local forms of *V. urticae*.

Vanessa io, Linn., vars., Pl. VIII., figs. 7, 8.

A curious form of this species is represented by two examples selected from several similar specimens in Mr. Leech's collection. Figs. 7 and 8 show the extremes between which this form fluctuates. In the large series of *V. io*, which comprises the specimens now figured, are individuals showing various modifications of the "eyed-spot" on secondaries; the gradations between the complete ocellus of the type and the aberration (fig. 8) are well illustrated. These specimens, together with very many aberrations of other species to which reference may be made at a future date, were in an extensive collection of Palearctic

Lepidoptera made by a well-known German entomologist, and recently purchased by Mr. Leech. It has been ascertained that the examples Mr. Leech has, and a number of others like fig. 7, were bred by a boy in Germany who had secured a batch of larvæ, none of the imagines produced being quite typical.

A variety of *V. io*, bred from a larva found near Lea Bridge, now in the collection of Mr. Bond, and figured in Entom. vi. p. 105, is of the same form as that now figured (fig. 7), but the white spots on primaries are more clearly defined.

Goossens records (Bull. Soc. Ent. France [5], v., cxlix.), a variety of *V. io* which from his description appears to be very similar to fig. 7, and this is probably ab. *dyopthalmica*, Garbini (Bull. Soc. Pad. i. 19, 20), or var. *exoculata*, Weymes (J. B. Ver. Elberf. v. 58), but I have not had an opportunity of seeing the descriptions of either of these.

Mr. Marsh, from larvæ obtained at Grange, bred two specimens of *V. io* which were semi-transparent, due to absence of the normal reddish-brown scales. In my earliest days of collecting I reared a whole brood of such varieties, and turned them all adrift because they did not come up to my idea of what the "peacock butterfly" should be. I need hardly say that in those days I had no knowledge whatever of variation, and but little of typical forms. Coleman was then the only book on Entomology in my possession, or which I even knew of. I may add that I have the work now, and the date is 1863.

Var. *ioides*, Ochs. Schmett. Eur. I. i. p. 109 (1807). This is only a dwarfed form which occasionally occurs in nature, but not confined to any particular country or district. Bernard considers that this form is produced from larvæ which have fed on the flowers instead of the leaves of nettles (Ent. Nachr. ix. pp. 26, 27), but Sequers is of opinion that the small size of *ioides* is the result of a starved condition of the larva, and this agrees with my own observations, for I have often produced the form by simply putting larvæ, after their final moult, on short commons. As far as I know small examples of most species may be obtained by adopting the same plan.

Var. *sardoa*, Staud., is larger in size and more fulvous in colour than the type; it occurs in Sardinia.

Vanessa antiopa, Linn., var. *hygiæa*, Heyd. (= *lintnerii*, Fitch, Pl. VIII., fig. 4, modification.

In his 'Butterflies of New England' Maynard gives a figure of this aberration, and makes some observations on it and the type which it may be of interest to quote here. He says:—"This species is, as a rule, quite uniform in coloration: spring specimens which have hybernated are, however, much paler, and sometimes a summer specimen is quite light on the border. The

width of the border usually varies but little, yet occasionally there is a form in which the band broadens out, especially on the secondaries, and encroaches upon the spaces usually occupied by the dark band, which is entirely absent, as also are the bluish spots. On the primaries the dark band is present, but the bluish spots are missing, and the ground colour inside the band is much more reddish than in typical specimens. This is the form known as *lintneri*, a specimen of which is figured on Plate II., fig. 18*b*. Known from all other butterflies by the dark colour and yellow border. This species occurs throughout New England. The peculiar form of this species which I have figured is usually produced from insects which are typical, and about one in five hundred is said to assume these peculiar colours, which is probably due to the law of reversion. The specimen figured was slightly deformed."

Scudder, in his splendid work, 'The Butterflies of the Eastern United States and Canada,' now in course of publication, says that the first example of *hygiea* which came under his notice was in the collection of Mr. T. L. Mead, and had been taken in Albany. He describes it as follows:—"The upper surface . . . (excepting the mottled costal border of the fore wings) is uniformly maroon, as far as the outer of the two yellow costal bars of the norm, and nearly as far as the inner edge of the blue spots of the norm; beyond this the whole outer portion is of the normal yellow, grizzled with brown, as in the upper part of the fore wing normally; there is no inner costal striga on the fore wings; beneath these are similar peculiarities, with only slight traces of ferruginous on the outer edge." Another specimen, in the collection of Mr. Denton, taken in Ohio, is said to differ from the one just described "in that the yellowish margin of the hind wing is very much broader on the right side than on the left, being more than double the normal width, and having a nearly straight inner margin, suppressing not only the black band which should border it on the inner side, but also the blue spots included in this border. These blue spots are, moreover, wanting in all the other wings, excepting a few scales in the lower median interspace of all the wings, and the upper median interspace of the left hind wing." Quoting Mr. S. L. Elliott, Mr. Scudder goes on to say that "of 380 specimens of one brood twenty-five examples were aberrations:—"Two of the varieties were *lintneri*, from which all the blue had disappeared; the third had the primaries *lintneri*, while the secondaries had the usual blue spots; the fourth had the secondaries *lintneri*, while the primaries bore the blue spots. In the remaining twenty-one the whole upper surface of the wings had a mottled appearance, showing that the colours had been disturbed. They retained the blue spots, but the spots were much smaller than usual."

In Ann. Soc. Linn. Lyon, xvi., Millière figures a specimen of *Vanessa antiopa* of the *hygiæa* form from Moravia: this has the inner yellow costal spot on primaries intact; there are also some blue submarginal spots, but the yellow border extends to and absorbs the second costal spot; the secondaries are normal, but the veins are paler. Another variety from Dalmatia, described by Millière, and one referred to by Tarati (Bull. Ent. Ital., xi., pp. 158, 159), appear to be modifications of *hygiæa*. Mr. William Werner records this form of *V. antiopa* from Germany (Entom. xxi. 89); and Mr. William Powley (l. c., p. 109) says that he bred it, with an example of the type, in 1883; but the locality from whence the larvæ were obtained is not indicated. Mr. Leech has several examples of this variety from Germany. The specimen figured has been selected because it exhibits a modification not previously figured. Strecker, in his 'Catalogue of American Macrolipidoptera,' notices a specimen, taken in New Jersey, which has the border on the upper surface of primaries black instead of yellow; and Seba (vol. iv., t. 32, figs. 5, 6) represents a variety of *V. antiopa*, in which there are none of the normal white marks on the costa of primaries above, and the under surface of all the wings is of a uniform dark colour, without any ornamentation. Herbst figures a large specimen with the blue spots of considerable size (vii., t. 168).

It would seem that in Canada *V. antiopa* is generally known by the common English name of Camberwell beauty; but in America it is designated the "mourning cloak," which name is, Mr. Scudder says, without doubt a translation of the German "trauermantel." With regard to the yellowish border of this species, Thoreau considers this protective. He says:—"The broad buff edge of the *Vanessa antiopa*'s wings harmonizes with the russet ground it flutters over; and as it stands concealed in the winter, with its wings folded above its back, in a cleft in the rocks, the grey-brown under side of its wings prevents its being distinguished from the rocks themselves."

EXPLANATION OF PLATE VIII.

- Fig. 1.—*Vanessa urticaæ*, var.
 „ 2.—*V. urticaæ*, var. *ichnusoides*, De Selys, Enum. Lep., p. 31.
 „ 3.—*V. urticaæ*, var. *connexa*, Bull., P. Z. S., 1881, p. 851.
 „ 4.—*V. antiopa*, var. *hygiæa* (modification), Heyd. Verz. Eur., i., p. 1, t. 1 (1779).
 „ 5.—*V. c-album*, var. fig. 6, under surface.
 „ 7.—*V. io*, var. ? *dyopthalmica*, Garbini.
 „ 8.—*V. io*, var.

ENTOMOLOGY OF ICELAND: NOTES UPON A VISIT IN 1889.

BY THE REV. F. A. WALKER, D.D., F.L.S., &c.

It will be remembered that I recently asked for information upon the subject of butterflies in Iceland (Entom. 157). As yet my own evidence is negative, and I can only say I have ridden 200 miles in the south-west district of the island, *viz.*, 75 miles from Reykjavik *við* Thingvellir to the Geysir and back (150), and 25 miles from Reykjavik to Krisuvik and back, and have never seen or heard of a single rhopaloceros insect. Some of the days occupied in this mode of travel were so fine and hot, that had there been any butterflies at all in the district I feel sure I should have seen them, more especially as all my time was not spent in riding, but I halted two or three days at Thingvellir, and took several strolls in its valley, during some of the finest weather that we enjoyed on our expedition. What will probably be regarded as a stronger evidence of their non-existence is the fact that Mr. Paterson—a most genial and pleasant Scotchman, who has resided eleven years at Hafnafjörður, in the capacity of English consul, as well as merchant—informed me that he had not seen a single butterfly during the whole of that period.

I am informed, on the reliable testimony of Mr. Jon Thoroddsen, of Reykjavik, who is occupied on the geological survey of the island, that he observed a single specimen of *Vanessa cardui* in Shore Street, Reykjavik, last summer; he said that he knew it again from having seen it in Denmark. He is of opinion that it made its appearance from off one of the Danish steamers or merchant vessels that run periodically between Reykjavik and Copenhagen. This seems probable, particularly as no second specimen is recorded.

In addition to the places in the south-west to which I have ridden, I have also coasted along the greater part of the island, and landed, net in hand, at every fjord where the steamer stopped for a few hours, weather permitting, without seeing any butterfly.

It is my belief that in the passage in which Mr. Symington speaks (in his 'Iceland and the Faroes by Pen and Pencil,' published in 1862) of white and blue butterflies,—both flying and fluttering kinds, in the neighbourhood of the Bruarà River, which we crossed *en route* to the Geysir,—that he must have meant moths, and the Geometridæ in particular, so abundant there, of which the ground colour is white, with a bluish or greyish crooked band across the fore wings.

Mr. Steincke—who passes part of the year in Akureyri and part in Copenhagen, and who is now on board our steamer, the 'Thyra,' as I write, bound for the latter place—informed me that there were a great number of beetles to be found in the North of

Iceland, but only ten species. Also that June was the best time for Lepidoptera, — moths presumably. I have seen several Noctuæ and Geometridæ, collected by him and a relative, as they have been in the habit of supplying the museum at Copenhagen, and also Danish and German private gentlemen, with insects and eggs for some years past. But Mr. Steincke had no butterflies, neither did he contribute evidence of any having been seen.

My friend Dr. Valentine Knaggs, who visited Krisuvik a few days previous to myself, when the weather happened to be very fine and hot, told me that he saw a specimen of one of the larger Fritillaries there, which, having no net, he could not capture. I simply state the fact as recorded on his authority, and do not venture to suggest the possibility of a mistake on his part, as his father's knowledge of Entomology has doubtless rendered him perfectly familiar with the appearance of *Argynnis paphia*, *A. aglaia*, and *A. adippe*. He also stated the occurrence of many very large Noctuæ there.

As though to make up for the total absence of diurnal Lepidoptera, the quantity of certain species of moths is something astonishing. I do not recollect ever having seen Geometridæ so abundant elsewhere, — rising in a cloud from the scrub vegetation when the dwarf willow or birch was lashed by the riding-whip of our guide, on the grassy slopes of the mountains, and likewise on the meadows adjoining the homestead; everywhere most numerous.

There are no bright-coloured insects in Iceland. The moths are generally either marked with grey or dusky, like the lichen-covered boulders of lava, which the moths so closely resemble, and on the surface of which, therefore, they often effectually conceal themselves from view. The flower, *par excellence*, that the Noctuæ affect is *Thymus serpyllum*, which is common everywhere in Iceland, the one plant that flourishes closest to the boiling springs of the Great Geysir and its brethren. I may add that the best localities apparently for Noctuæ in the island are the vicinity of hot and sulphurous springs, whether at Geysir, Krisuvik, or Laug (near Reykjavik), as though they revelled in the warm air and soil. *Noctua conflua* occurs very commonly, and the colour of its upper wings is much varied in different specimens. Of *Larentia cæsiata*, which appeared in full force at Thingvellir on July 14th, — of which species not a single specimen was visible when I left that place for Geysir on July 11th, — the melanic, as well as the paler, form is met with, as in Scotland.

I do not recall having noticed any facts of value as regards geographical distribution. The insects along the north coast, and also the eastern coast, of Iceland seem to me to be precisely the same as those on the western, only that those on the western shore are far more numerous as regards individuals, probably also in species.

I landed at about fifteen different fjords for the purpose of investigation, but only for a few hours on each occasion, when it was a chance whether in that brief interval I could light on the best locality in the neighbourhood, losing time, moreover, by having to wait till the steamer's boat was ready to be sent to shore, having to return to the steamer for one's meals, and sometimes, as the steamer's stay was short, having necessarily to remain near the landing-place.

What has struck me forcibly is the succession of different Geometridæ in point of time, the average duration of any one species in abundance and good condition being from ten days to a fortnight. Diptera would appear to take the place of Hymenoptera, the latter tribe being only represented by *Bombus terrestris*, which occurs very sparingly; and one or two small Ichneumonidæ, also rare. Whereas among the Diptera may be mentioned, first and foremost, *Scatophaga stercoraria* and *Calliphora erythrocephala*, the latter species occurring everywhere in appalling numbers,—on the *Angelica islandica*; on the piles of fish drying on the moor, walls, or boulders at Reykjavik; on a mass of whale-blubber festering in the sun; as well as everywhere else.

I am not aware that any other British entomologist has gone round the coast of Iceland on behalf of science, therefore the name of every species in a list of my captures shall be appended hereto, and when and where obtained. I will, however, first describe the character of the country, and my manner of visiting it.

On July 21st I rode out in the evening from Reykjavik to Hafnafiord en route for Krisuvik. This small fishing-town stands on the borders of a quiet and very pretty bay, where there are several fishing-boats riding at anchor. The houses of Hafnafiord are painted grey and red, as at Reykjavik, and there is a good road from the capital here. Also, as at Reykjavik, the inhabitants are actively employed in piling up and drying fish.

On July 22nd, had a call from Mr. Paterson, the English consul here, and a very pleasant personage, who spoke of the Geysirs and boiling pools at Reyka, a day's journey from Krisuvik, as well worth prolonging the excursion for the purpose of inspection. He handed me the keys of the house and storehouse at Krisuvik, once the property of the now extinct Sulphur Company, and wherein travellers pass the night. It still contains many of the glass jars, tin vessels, &c., formerly in use for collecting and cleansing the sulphur; as well as a bed, hammock, rugs, coverlets, &c., for the passing visitor. The house is built entirely of corrugated iron, contains several apartments, and is a very well constructed and serviceable dwelling. Captured *Calliphora*; and after being joined by my fellow-travellers, and another guide from Reykjavik, we started, about 5 p.m., with

our united forces, for Krisuvik. When we had proceeded for about two hours, and forded a stream, we dismounted from our ponies on a little grassy islet. The water of the stream here, of which, however, I did not taste, was reported to be strongly chalybeate. The only farm, dilapidated and now uninhabited, on the whole of the way, was next passed. We then skirted the base of some lava hills on our left, past a wide extending desert of lava, as far as the eye could reach, only diversified by hillocks and ridges and jagged peaks, all covered with whitish green moss. I next noticed a natural bridge of lava close to the road, as though constructed for the express purpose of spanning a watercourse. The whole scene was highly picturesque. After some distance—more than half-way, and a steep ascent and corresponding descent—we enter on a plain strewn throughout its extent with small cindery lava, and studded with many boulders that have fallen from the heights above, unless borne down by the lava at some unknown period. A great deal of the more level surface of this plain also is covered with the whitish green moss. The last portion of the twenty miles from Hafnafiord, wherein not a single dwelling or human being was passed, proved very lengthy, trying, and fatiguing from the steep ups and downs, the many brows of hills to be crossed, as well as a plain covered with moss, that treacherously conceals holes, or hides the jagged boulders of lava beneath, or furnishes a superficial crossing, and so tempts one to tread on the velvety but yielding surface. In traversing the whole of this difficult ground we had to dismount, and the ponies to be led. Ultimately a farmer was knocked up on the far side of the plain, who provided some milk for one or two of our party, while a bottle of lager beer was uncorked for the remainder; and this individual undertook to pilot us on his pony over the intervening slopes by the nearest way to Krisuvik, as we had come a considerable distance out of our way. As we alternately ascended and descended several ridges, I noticed a large quantity of oxide of iron on the face of the hills in close proximity to the sulphur, and several solfataras, as well as volcanic lakes, in deeply depressed situations in this neighbourhood. The aspect of the hill-side in places resembles an inflamed and blistered sore, to which similitude the swollen shape, no less than the yellow and white and dark red hues, contribute. We wound our way across one grassy slope after another, crossed a stream flowing between deep banks, reached a meadow full of the hillocks so abundant in all this region, got to the Company's dwelling-house, and sought in its different apartments a few hours much-needed rest. Decidedly Krisuvik presents a sight worth seeing, and the scenery at the place and on the way thither repays one; but it must be owned that it is an arduous undertaking;—twenty miles, for the most part over by far the worst road in Iceland.

(To be continued.)

ON THE VARIATION OF INSECTS.

BY T. D. A. COCKERELL.

(Continued from p. 178.)

Class V.—VARIATION OF PUPE AND COCOONS.

It is now perfectly well established that many cocoons and exposed pupæ of Lepidoptera vary very considerably in colour, mainly in the direction of resemblance to the tint of their surroundings. Of these the following may be quoted as instances:—

Pupæ.—*Vanessa gonerilla*, light and dark varieties (Entom. xvi. 218); *V. urticæ*, light and dark varieties were produced by Mr. Jenner Weir by modifying the amount of light at the time of pupating: those in the shade produced the darker forms. *Melitæa harrisii*, Scudd., the typical pupa is white, marked and spotted with black, or brown-black, and orange; a variety is almost without the black markings, but has the orange (W. H. Edwards, Canad. Ent. 1877, 168). *Lycæna comyntas*, pupa from larva fed on *Desmodium marilandicum* is emerald-green, with a yellowish green abdomen, but the pupa from larva fed on clover is sordid white, with the wing-cases apple-green: both forms have also some markings (W. H. Edwards, Canad. Ent. 1876, 204). *Papilio ajax*, L., varies from dead-leaf brown to bright green; and *P. asterias*, Fab., from pale green to ochre-yellow and ash-grey. It has been said that the green pupæ of *P. asterias* emerge sooner than the dull-coloured ones, but I do not know whether this would hold good in a large number of cases. Last year I had a green and a brownish pupa of this species, and the green one gave a crippled butterfly on October 28th, while the other remained over until this year. No doubt the heat of the room brought the green one out thus early, but there was no apparent reason why it should not similarly affect the brown variety.

Cocoons.—*Samia cecropia*, (a) on red currant, silk deep reddish brown; (b) on cherry, plum and rose, light brown, tending to grey; (c) on *Spiræa*, *Symphoricarpos* and *Prunus serotina*, greyish brown (T. G. Gentry, Canad. Ent. 1877, 49). The experiments of Mr. E. B. Poulton to prove that the colours of cocoons are really influenced by the colours of their surroundings are very well known. Cocoons of *Saturnia pavonia* were dark brown when the larvæ were placed in a black bag, but white when they had been freely exposed to light, with white surfaces in the immediate neighbourhood. Larvæ of *Eriogaster lanestris* exposed to white surroundings produced cream-coloured cocoons, while some of the same batch spun dark brown cocoons among the leaves of the food-plant. Larvæ of *Halias prasinana* exposed to

white surroundings produced white and very light yellow cocoons. A larva which spun a white cocoon had previously commenced a brown one, but on being removed to white surroundings it produced white silk. Mr. G. F. Mathew has recorded some very interesting experiments (Trans. Ent. Soc. Lond. 1885, 364), showing the influence of surroundings on the pupæ of species of *Papilio*. *P. godeffroyi*, which had been allowed to pupate on scarlet or white paper, gave rosy-pink pupæ, while those on blue or yellow paper were green, and those on black paper very dark green. *P. schmeltzi* was also experimented upon, but was not so much affected by the colour of background: this was attributed to its having a thicker pupa-shell. The newly-changed pupæ of both species were pale green, and it was not until several hours had elapsed that they assumed the colour produced by their surroundings. Mr. Mathew ventures an explanation of these curious phenomena, and says "They are very soft, and are covered with a thin coating of some viscid substance, which may have the power of absorbing refracted rays of colour-light as they dry and harden." This, however, is rather a peculiar hypothesis, since, if the pupæ were to "absorb" the light reaching them and refracted from the coloured paper, it is to be presumed that they would not at the same time reflect it, and their colour would consequently be the complementary one to that of their surroundings, or more probably black.

HYBRIDS.

The frequency and probability of hybrids in Nature has been very freely discussed at different times, but, owing to the difficulty of obtaining satisfactory data, without any very decisive result. Yet it is quite certain that, at any rate under artificial conditions, hybrids may occur both among plants and animals between genera that are universally considered distinct, while hybrids between allied species are frequently found in Nature. The ducks among birds, and the willows, thistles, and verbascums among plants, afford excellent instances. This being so, there is no apparent reason why hybrid insects should not also occur under natural circumstances, and, as a matter of fact, many such have been recorded. Hagen (Canad. Ent. 1876, 78) enumerates the following hybrids which he found recorded in European literature: — *Saturnia carпинi* × *spini* (larva), "*Sphinx*" *vespertilio* × *euphorbiæ* (larva), "*Sphinx*" *vespertilio* × *hippophææ* (larva), "*Sphinx*" *euphorbiæ* × *galii* (imagines, near Berlin), *Zygæna trifolii* × *filipendulæ* (imago, England), *Colias edusa* × *hyale*, *Lycæna adonis* × *alexis*, *Hipparchia arcania* × *hero*, *Cœonympha pamphilus* × *iphis*, *Vanessa urticæ* × *atalanta*. A. Wailly (Canad. Ent. 1880, 228) had hybrid larvæ of *Samia ceanothi* × *gloveri*, but they died. P. R. Hoy obtained hybrid *Pieris rapæ* ×

protodice larvæ, but these also died before reaching the perfect state. In 'Proc. South Lond. Ent. Soc.' (1886, p. 32) is recorded a *Xanthia*, supposed by Mr. South to represent *X. fulvago* \times *flavago*. Supposed *Lycæna bellargus* \times *corydon* hybrids are recorded in the same volume (p. 61), and in 'The Entomologist,' 1887, there is much discussion about a form of *Lycæna* found in Kent, referred by Mr. Sabine to *L. bellargus* \times *icarus*.

With regard to this last form, which appears to occur quite numerous in certain districts, the theory was proposed by Mr. South that hybrids between *bellargus* and *icarus* were probably fertile *inter se* and with the parent species, and so he supposed that a local variety might have been founded directly upon the results of hybridization. It is impossible to say that this could not be the case; and indeed we know that by cuttings, &c., florists have been able to propagate hybrids in such abundance and constancy of form that they have come to be looked upon by the public as genuine species,—such, for instance, is the beautiful *Clematis jackmanni*. Nevertheless, the general laws of variation, so far as we understand them, seem to point against the probability of the establishment in Nature of a hybrid race between two forms so distinct as to be looked upon as species, because *when divergent varieties have become so stereotyped, their hybrids are nearly always infertile*, while, on the other hand, *if they are still plastic, the tendency of the fertile offspring will be more often to closely resemble one or the other parent, than to take a position intermediate between the two*. I may have occasion to discuss this question at greater length hereafter, but to enter into much detail would lead rather beyond the scope of the present paper. As to the cause of hybridization in Nature, it may not unfrequently be due to a scarcity of one sex of a species. For instance, Hagen relates that *Tetrao urogallus* \times *tetrix* hybrids occur always when, by excessive hunting, the males of *Urogallus* (capercaillie) are killed in such numbers that the females are obliged to resort to the males of the other species (black grouse). In discussing the *Lycæna* so-called hybrids, it was held by some that the fact of the species not flying continuously together, but only overlapping, so to speak, was rather against the probability of hybridization. To me, it seems quite the other way.

The males of many butterflies emerge about a week before the females, and for the time being must wait for mates. Suppose, to illustrate the point, that we have two butterflies, A and B, which are double-brooded, each brood being on the wing one month. The males of each species emerge a week before the females, so that for the first week of the month during which the species is flying we have only males, and by the fourth week the males are about over, and the females largely preponderate. A begins to emerge on the 1st of June, B about the 25th of the

same month, and each has its two broods, with three weeks' interval between each. Thus we get—

JUNE.				JULY.			
1st week.	2d week.	3rd week.	4th week.	1st week.	2d week.	3rd week.	4th week.
A... ♂	♂ ♀	♂ ♀	♀	—	—	—	♂ &c.
B... —	—	—	♂	♂ ♀	♂ ♀	♀	— &c.

From this it is readily seen that we have males of B flying with females of A during the last week of June, each without its proper mate, while again, at the end of July, some late females of B might be found with early males of the second brood of A. What circumstances could be more favourable for the production of hybrids? I have no knowledge whether this is actually the case with any of the species of *Lycæna* that have been under discussion, but I wish to show that, on general grounds, the fact of two butterflies overlapping in their periods of emergence is more favourable for hybridization than if they flew quite synchronously.

(To be concluded.)

CORRECTION.—Maynard's reference (p. 5) to black *females* of *L. pseudargiolus* probably originated in the original error of referring the black males to the female sex. There is no satisfactory evidence of a black female of *pseudargiolus*.

CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.

By J. W. TUTT, F.E.S.

(Continued from p. 210.)

Mamestra, Och., *sordida*, Bork.

THE type of this species is thus described in Borkhausen's 'Naturgeschichte der Europäischen Schmetterlinge,' p. 239:— "It is as large and nearly the shape of *Noctua brassicæ*. The fore wings mottled, with a mixture of earth-grey and pale dirty brown; markings extremely indistinct and pale. In some specimens three pale transverse lines can be distinguished: the one at the base is very pale; the second has particularly strong zigzag marks near the inner margin; the third forms a slight semicircle. They are all paler than the ground colour, but edged with darker. On the inner side of the third line is a row of brownish moon-shaped spots, which turn their hollow sides inwards. Close to the hind margin is a pale zigzag line, which forms in the middle a small Latin W. The ordinary markings between the second and third transverse lines are very faintly marked; the claviform is indistinctly surrounded with whitish grey, and scarcely visible;

the reniform is strongly marked with blackish grey, outlined with whitish, and with a grey centre; the orbicular is pale brownish; the costa has some dark spots, and near the apex are a few yellowish spots. Hind wings whitish grey, shaded with black at the outer margin; veins darker; transverse line sometimes traceable. This *Noctua* varies considerably in the amount of light and dark shading of the wings; in some specimens the colour of the wings is very dark, and frequently black is mixed with the ground colour."

This is another variable species, the ground colour extending from a pale unicolorous ochreous-grey, with scarcely any markings (var. *renardii*), to a bright reddish ochreous (var. *ochracea*), through a dark grey form much suffused with red (var. *anceps*), to a form entirely made up of a dark, dirty-grey ground colour, much suffused with darker greyish brown (the type). The dark red suffused forms (var. *anceps*) and the dark earth-grey and brown (the type) forms are much more common in Kent than any others, the pale ochreous and reddish ochreous forms being rare. The var. *renardii* of Boisduval is an extreme development of the pale ochreous form. Of the general variation of this species, Guenée writes, "It varies much, but all its modifications are too unimportant and unstable to constitute distinct races" ('Noctuelles,' vol. v., p. 195). There would thus appear to be four fairly distinct forms:—

1. A pale unicolorous grey form, = var. *renardii*, Bdv.
2. A reddish ochreous form, = var. *ochracea*.
3. A dark grey, mottled with reddish ochreous, form, = var. *anceps*, Hb.
4. A grey, mottled with dirty brown, form, = *sordida*, Bork.

α. var. *renardii*, Bdv.—This is a very pale unicolorous variety of *sordida*, with the markings in its extreme forms almost entirely absent, but leading up by intermediate forms into the other varieties. Guenée, in his 'Noctuelles,' vol. v., p. 195, thus writes of this variety:—"This is certainly only a very pale variety of *anceps*. All the markings have disappeared, and the upper wings are entirely of a whitish ochreous colour, with the exception of the terminal space, where there remain traces of greyish colour. The lower wings and the underside are of a pale shining whitish, without markings. North of France." This variety apparently occurs but rarely in England. I have taken it at Sandwich, Deal, and Strood, but have never met with it in any other locality, although I have received it from Brighton. It occurs in both sexes, and the hind wings show a large amount of difference in the quantity of grey shading, some having a distinct dark marginal band; others agreeing with the above description, and being without any very definite trace of it.

β. var. *ochracea*, mihi.—This is a very pretty variety. It is of a very pale yellowish ochreous ground colour, strongly tinged with red (I have one specimen entirely reddish ochreous), with the stigmata and transverse lines very pale grey. As in var. *renardii* there is scarcely any of the dirty grey colour present in the type, except on the outer margin. The variety occurs

in both sexes. I have captured it at Deal and Strood, and received it from Cambridge, but it is apparently a rare form.

γ. var. *anceps*, Hb.—The *anceps* of Hübner is an extreme development of the last variety, with the ground colour dark brown instead of pale ochreous, but much mottled with reddish, as in that form. Hübner figures it in his 'Schmetterlinge,' &c., 484, the following being the description made of it:—"Anterior wings ochreous-brown, tinged with reddish; an abbreviated transverse line followed by a complete basal line; claviform outlined in blackish, the reniform and orbicular in whitish; directly beyond reniform, a double line internally edged with black; a pale wavy line close to hind margin, with a W-shaped mark in its centre. Hind wings dark grey, with pale base; two pale transverse lines pass through the dark grey margin." I would include under this varietal name all dark brownish forms mottled with red. This is the most abundant form occurring in Kent, being much more abundant than the type, which is of a greyish colour, marked with dirty brown. The *anceps* of Hübner is the usual form found in London.

Mamestra, Och., *furva*, Hb.

The type of this species is represented by Hübner's fig. 407, which I have described as follows:—"Anterior wings reddish brown, with an abbreviated, followed by a complete basal, streak, both of which are ochreous and very pale in colour; stigmata outlined with yellowish, a dark transverse line passes between the stigmata from costa to inner margin, two pale wavy ochreous lines between the reniform and hind margin. Hind wings grey, dark on the outer edge, with a pale line running through the darker part." My own note is this:—"This is not a good figure of *furva* as we know it, and presents a strong superficial resemblance to *L. cespitis*, but the transverse lines are different to those of that species, and agree exactly with those of *furva*." Guenée mentions two varieties, both from Russia; and Freyer has figured another. Herr Hoffmann, in the 'Stettin Entomologische Zeitung,' writes of the Shetland *furva*:—"Kleiner und dunkler als Stücke aus den Schweizer Alpen." Guenée's description (*vide* var. *ochracea*) of *furva* would answer very well for specimens I have from Ayton (Berwickshire) and Paisley, except that the ground colour is not yellowish brown; but those from Aberdeen, Pitcairle, and Sligo are much darker. My Paisley specimens are of the ground colour of Hübner's type, whilst the German, Swiss, and French specimens are paler. Our Aberdeen and Sligo forms apparently belong to var. *infernalis* and var. *silvicola*, which only appear to be slight modifications of *freyeri*. Taking Hübner's brown form as the type,—Guenée's *furva* is a lighter, *freyeri* and *infernalis* darker, and *silvicola* an extreme melanic form.

α. var. *ochracea*, mihi.—Guenée, in his 'Noctuelles,' vol. v., p. 197, describes *furva* as:—"Anterior wings yellowish brown, with the three first lines very distinct, wavy, geminated, and outlined with yellowish in the middle; the angulated line composed of lunules in contact, a series of very small yellowish dots between it and the subterminal, which is very distinct,

yellowish, wavy, broken in the centre and marked with an **M**, and preceded by three or four black wedge-shaped marks. The three stigmata clear, the outline of the reniform yellowish, the claviform short, black, often indistinct. Fringe spotted. Inferior wings greyish yellow, with a broad dark border, cut near the anal angle by a short clear line, and a large dark lunule." I do not think we get so pale a variety of *furva* as this in Britain. Mr. N. F. Dobrée writes:—"I have specimens from Turkestan, and these agree pretty closely with the var. *ochracea*" (*in litt.*).

β. var. freyeri, Frey.—The type of this variety is figured by Frey in his 'Neuere Beiträge,' &c., pl. 159. It has the "Anterior wings of a more blackish ground colour." But Guenée, in his 'Noctuelles,' vol. v., pp. 197, 198, writes, "I have seen a specimen sent from Germany under this name, which does not differ in tint from the ordinary *furva*." My own description of *freyeri* is as follows:—"Anterior wings blackish grey, with seven short black costal streaks, with pale (almost white) transverse basal line; orbicular and reniform outlined in white, a pale wavy line directly beyond the reniform, followed by a transverse row of pale ochreous dots, and a pale wavy line (white), edged internally with blackish wedge-shaped marks (in contact) parallel to the hind margin. Hind wings pale grey, outer margin dark grey, lunule and nervures still darker."

γ. var. infernalis, Ev.—"Eversman, 'Bull. Mosc.,' 1842, = *furva*, 'Fauna Ural.,' p. 247," is the reference given by Guenée for this variety. He also describes it as:—"Differs but little from *furva*. It is a little darker. The spaces in the stigmata are marked in brown. The discoidal line of the under sides of the inferior wings is a little more wavy, clearer, and appears a little on the upper side; but these differences are very slight, and perhaps not constant. Localities: Casan, Orembourg, and Ural" ('Noctuelles,' vol. v., p. 198). The specimens I have from Aberdeen would apparently belong to this variety.

δ. var. silvicola, Ev.—Guenée, also on p. 198, describes another Russian variety as "Superior wings still darker, almost black, with the stigmata and lines more or less absorbed by the ground colour. Inferior wings of a blacker shade. Thorax and anal tuft not mixed with yellow scales. Locality: Woods of the Ural." The specimens I have from Sligo would appear to belong to this variety.

Mamestra, Och., *albicolon*, Sepp.

The type of this species is figured by Sepp in his 'Beschouwing der Wonderen Gods,' &c., II., pl. 1, figs. 1-9; and is described by Guenée, in his 'Noctuelles,' vol. v., p. 196, as:—"Anterior wings of a blackish grey, on which stands out strongly the little white broken **C**, which borders the lower and outer edge of the reniform. None of the other markings are very distinct." Guenée also adds:—"I have never found the type in our country (France), where the following variety (*brunnea*) is found occasionally." I have taken this dark type at Deal, and have also received it from Mr. Baxter, where it was taken in the neighbourhood of Fleetwood; but generally our British specimens are the grey *albicolon* of Stephens. Mr. N. F. Dobrée, however, writes:—"I have taken *albicolon* through a series of years on the sandhills at the mouth of the Humber, and there the dark form predominates" (*in litt.*).

Hübner also figures a dark brown form, which Guenée says "occurs occasionally in France." There is a little variation in the character of the pale line, which is parallel to the hind margin; in some the line is fairly complete, in others it forms a row of white dots, while in others they are distinctly yellow. There is also a considerable amount of variation in the colour of the hind wings, this variation not being sexual; in some specimens the hind wings are entirely dark grey, in some pale grey, and in others pale grey with a dark hind marginal band. One of my Deal specimens has a transverse row of white dots between the discoidal spot and the subterminal line, and it is dusted with white along the nervures.

α. var. brunnea, mihi.—This is Guenée's var. *A*, which he refers to Hübner's fig. 543. The note I made of Hübner's figure is as follows:—"Anterior wings dark brown, but all the markings very distinct." Guenée's description of the variety is as follows:—"Anterior wings yellowish brown, more or less pricked out in blackish, with the subterminal line of a yellowish white, broken up, but well marked, and the ordinary lines more distinct than in the type. Inferior wings paler, and tinged with the yellow of the upper wings" ('Noctuelles,' vol. v., p. 196).

β. var. cinerascens, mihi.—This is the English form, which is much greyer than the continental specimens. It is Guenée's second var., which he calls *albicolon*, St., and he takes as his type Stephens's 'Illustrations,' &c., vol. ii., p. 184, and pl. xxiv., fig. 3. He describes it, 'Noctuelles,' vol. v., p. 196, as:—"Anterior wings ashy grey, strongly sprinkled with black atoms, with all the markings very distinct. The subterminal line as in var. *A*. The two stigmata paler and clearer. The reniform almost entirely surrounded with white. The black terminal points triangular, and well marked." The only locality Guenée gives is "England." As a rule, our English specimens have not the wedge-shaped spots so distinctly marked. Of this grey (British) variety, Mr. Robson has a strongly-marked specimen, which almost resembles Guenée's var. *β*. It is of a pale ochreous grey ground colour, with the black transverse basal lines very strongly marked, and the space between the strigæ directly before and beyond the reniform filled in with darker, so that it resembles a narrow band. I have seen no other specimens like it.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

ARGYNNIS AGLAIA, VAR.—Whilst collecting one day during the month of July, in Carmarthenshire, I noticed a beautiful aberration of *Argynnis aglaia*, which I unfortunately missed capturing through its escaping from under the net. On the upper side of the right lower wing, near the base, was a beautiful golden metallic spot, the corresponding marking on the left wing being paler in colour than the general ground colour, so that it, like the metallic spot, was quite noticeable. I might add that the insect was a male specimen, evidently not long emerged.—T. B. JEFFERYS; Cirencester, August 6, 1889.

ENTOM.—SEPT. 1889.

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DEILEPHILA GALII IN YORKSHIRE.—On the 12th instant a fine male specimen of the above insect was brought to me. It was taken at rest in a garden in this neighbourhood. I think this is the first time that *D. galii* has been taken here.—WALTER COPLEY; Clough Terrace, Sowerby Bridge, August 24, 1889.

SESIA ICHNEUMONIFORMIS IN GLOUCESTERSHIRE.—I was successful in taking two specimens of *S. ichneumoniformis*, one male and one female, at rest on blades of grass in an old quarry on the side of Stinchcombe Hill, near Dursley, on July 22nd.—T. G. MASON; 8, Lansdowne Road, Higher Crumpsall, Manchester, August 14, 1889.

ZEUZERA PYRINA.—Records of the capture of *Z. pyrina* (*æsculi*) are not very frequent: this may be because the insect is so common that its capture is not thought worth recording, or because it is not very often taken. I have for some years been under the impression that in London the species was common. My past record is as follows:—1881, July 14th: a worn female found on the ground in the garden of the house I used to live in. 1883, July 15th: a worn female brought to me, found in a neighbouring street. 1886, June 30th: a male found at Hackney. July 8th: a male found under a lamp just outside this house. 1887, July 10th: two females emerged from a lilac in my garden. 1888, August 20th: one female emerged from the same tree. 1889, June 28th: a male taken under the lamp already mentioned. In addition to these I have occasionally seen males lying dead inside the windows of public-houses. My captures so far had been sporadic, and had not furnished any very definite indication of the kind of place in which to look for the moth, and of the trees which in London it chiefly affected. On July 5th of the present year the caretaker of an open space in this neighbourhood showed me a male and two females, which he had picked up the previous day under a drooping ash. I found a good many empty pupa-cases sticking out from the tree, and, on exploring the ground thoroughly, was pleased to find a good many infected trees. Between that date and the 15th I secured about forty specimens, most of them having only just finished drying their wings. The proportion between the sexes was very striking, there being only seven males to thirty-three females. Why this should be I know not, unless it be that the larva of the male, being possibly smaller than that of the female, is able to pupate in the smaller branches at the upper part of the tree, whilst the larger female larva is obliged to work its way down to the larger part of the tree to find room. The moths were found at all heights on the trees, from a few feet above the level of the ground up to about twenty feet, and empty pupa-cases were seen sticking out here and there as high as my light could reach. The enclosure, which is about $2\frac{1}{2}$ acres in extent contains lime, balsam and black poplar, willow, alder, and ash trees, but with the exception of one of the alders, the ash trees were the only ones that were infected, and every one of these was more or less so. I have since looked pretty carefully at the trees in the neighbourhood, and have discovered several infected ash trees and one sycamore. The normal hour of emergence is clearly about 3 to 4 p.m. One specimen was still drying its wings at 5 p.m., and many specimens were found at that hour close to fresh pupa-cases, where none had been at mid-day. The time of year at which the insect should be looked for in normal years appears to be the last week in June and the first fortnight in July. A peculiar feature in

connection with the species is the rapidity with which *rigor mortis* passes off. As a rule I find it best to leave insects in the killing bottle for more than forty-eight hours, but *Zeuzera pyrina* sets most readily within twenty-four hours of death, and again stiffens if left longer. Another peculiar feature is the eagerness with which the females, which have only just emerged, deposit eggs as soon as they are placed in a box or killing-bottle. I hope that these notes may enable other London entomologists to hunt for this species with success next year.—FRANCIS JOHN BUCKELL, M.B.; 32, Canonbury Square, N., July, 1889.

ACRONYCTA ALNI. — I have a larva of this moth, which I found feeding on the horse-chestnut. Is not this uncommon for its food-plant? It appears to commence feeding near the midrib of the leaf, and then eats out the centre of the leaf.—T. B. JEFFERYS; Cirencester, August 6, 1889.

LUPERINA TESTACEA, VAR.? GUENÉE. — It may be interesting to state, in relation to Mr. Tutt's remarks for last month upon this insect (Entom. 205), that, among the scores of *L. testacea* I have taken at our Chester gas-lamps, I only numbered one var. *guenéei*.—J. ARKLE; 2, George St., Chester.

CARADRINA AMBIGUA IN THE ISLE OF WIGHT. — On looking through Mr. A. J. Hodges' collection of Lepidoptera yesterday, I found two fine specimens (male and female) of *C. ambigua*, taken last year in the neighbourhood of Yarmouth. I also captured a worn specimen in the same locality myself this year. This makes three British localities, the previous captures having been made by Mr. Vine at Brighton, and by myself at Deal.—J. W. TUTT; August 22, 1889.

AGROTIS LUCERNEA IN KINCARDINESHIRE. — During July and August this year I took *A. lucerneae* abundantly in Kincardineshire near the coast, but it was very local. I never heard of them being taken here before.—L. G. ESSON; 46, North Charlotte Street, Aberdeen, N.B.

NOCTUA SOBRINA IN GLEN ARTNEY, PERTH. — I am pleased to be able to record this at sugar, on August 7th, in a small wood between Dalrannoch and Blairmure, on the Aberuchill estate, Perthshire. The specimen is slightly paler, but otherwise identical with Rannoch examples. The Glen Artney locality is, I suppose, twenty or twenty-five miles south of Rannoch as the crow flies. Sugaring, the few nights I attempted it in Scotland, was far more productive than my essays in that direction at Brockenhurst, Hants, in the middle of June. I was struck with some beautiful varieties of *Xylophasia monoglypha* (*polyodon*), and also of *Calymnia trapezina*, which occurred in multitudes. A fine *Triphana fimbria* also was captured, *Noctua confusa*, and many others.—J. COSMO MELVILL; Great Marlborough Street, Manchester.

CALYMNIA PYRALINA. — On August 16th I had the pleasure of seeing the whole family circle of *Calymnia* out at sugar, a sight, I should think, not often seen; there was, I regret to say, only one representative of *C. pyralina*, but she paid the penalty of her unwonted publicity. I also took, on the same night, two *Noctua stigmatica* (*rhomboidea*), an insect which has, in this locality, been sufficiently common this year. I observe

that some books mention that it is to be found in this county.—H. J. WHITE; Frogmore Lodge, St. Alban's, Herts.

NATURAL PAIRING OF AMPHIDASYS BETULARIA AND VAR. DOUBLEDAYARIA.—It may be remembered that, last season, I took a female type *A. betularia* and black male in copulâ, from an oak in Delamere Forest. Their progeny show 85 per cent. to be black; the rest are ordinary types.—J. ARKLE; 2, George Street, Chester.

CRAMBUS FURCATELLUS IN SUTHERLANDSHIRE.—On July 20th, last year (1888), when ascending Ben Hope, a conspicuous mountain in North Sutherlandshire, in company with Mr. Frederick Hanbury, we carried no entomological impedimenta, our principal object being to study the botany of this remarkable and isolated height (3048 ft.). I was enabled, however, to box a few specimens of a *Crambus*, which was flying about plentifully at about 2000 feet elevation. It appears to be a variety of *C. furcatellus*, differing from specimens I have from Snowdon in the fringe of the upper wings being pearly white instead of grey; posterior wings dark grey, radiately streaked with whitish grey; fringes silvery white. I am not sure whether this moth has been hitherto recorded from Scotland. On the same mountain was a small form of *Scoparia alpinalis*, and *Emmelesia adæquata* was frequent among the heather and cotton-grass.—J. COSMO MELVILL; Great Marlborough Street, Manchester; August 21, 1889.

TORTRIX PICEANA IN NEW FOREST.—I have pleasure in recording the capture of *T. piceana*, by Mr. Charles Gulliver, in Ranmor Enclosure, Brookenhurst. This is the more gratifying as he had devoted a great deal of time in searching for the larvæ, but without success. Those who wish specimens of this rarity will do well to apply to him at once, as he has only a few specimens.—SAMUEL JAMES CAPPER: Huyton Park, near Liverpool, August 8, 1889.

CATOPTRIA EXPALLIDANA, &c., IN THE ISLE OF WIGHT.—I was fortunate in taking a nice series of this very local species in the neighbourhood of Yarmouth at the end of July. Macro-Lepidoptera collecting generally, especially for Noctuæ, was almost a failure, although several local Geometræ were found. Micros, however, kept me busy setting during the time I was in the island, many good local species occurring in fairly large numbers. On the last two evenings of my stay (Aug. 11th and 12th), Noctuæ, although they would not come to the "sugared" trees prepared for their benefit by my friend Mr. A. J. Hodges, came in considerable numbers to the sugared (and unsugared) flowers of *Eupatorium cannabinum*, which were in splendid masses; among others, *Mamestra abjecta* (worn), *Caradrina ambigua* (worn), and *Hadena suasa* (in fine condition, probably a second brood) occurred. Besides Noctuæ, an occasional specimen of *Calligenia miniata*, *Lithosia griseola*, *L. lurideola*, *Epione apiciaria*, *Cidaria silaceata*, *Scoparia cembra*, *Botys asinalis*, *Edematophorus lithodactylus*, *Rhodophaea advenella*, and various Depressariæ put in an appearance. Unfortunately I was compelled to leave the island just as the larger things were becoming more lively.—J. W. TUTT; Westcombe Park, S.E.

A FORTNIGHT IN CAMBRIDGE FENS, &c.—On June 22nd, accompanied by two friends, I started for Wicken, where we took up our

quarters for two weeks. The weather was very fine the whole time, not having even a drop of rain; the heavy dews that prevailed and the continual east wind rendered the evenings comparatively unproductive, particularly for sugaring,—still, notwithstanding this drawback, we worked hard, and succeeded in getting several good insects at light, after often staying out all night with our fen-lamp. The following is a list of the most important captures :—*Macrogaster castaneæ* (6, 1 female), *Pterostoma palpina* (2), *Notodonta ziczac* (2), *Pygæa pigra* (6, bred), *Acronycta strigosa* (1), *A. rumicis* (2), *Arsilonche albovenosa* (1), *Xylophasia hepatica* (1), *Neuria reticulata* (10), *Mamestra albicollis* (5), *Agrotis vestigialis* (several), *Dianthæcia carpophaga* (5), *D. irregularis* (9), *Hecatera serena* (3), *Plusia festuæ* (2), *Heliothis dipsacæ* (2), *Acontia luctuosa* (1), *Aventia flexula* (1), *Geometra papilionaria* (3), *Acidalia rubiginata* (10), *Cidaria sagittata* (2), *Lithostege griseata* (2), *Chesias rufata* (1); also a long series each of *Leucania impudens*, *Agrophila trabealis*, *Bankia argentula*, *Toxocampa pastinum*, *Epione apiciaria*, *Hyria muricata*, *Acidalia immutata*, *Timandra amataria*, *Larentia didymata*, *Eupithecia scabiosata*, *Collix sparsata*, *Lobophora sexualisata*, *Scotosia vetulata*, *S. rhamnata*, *Cidaria dotata*, &c.—J. M. ADYE; Somerford Grange, Christchurch, August 14, 1889.

HYBRID LEPIDOPTERA.—In addition to the species of Lepidoptera which have been known to hybridize, mentioned by Mr. Cockerell in his papers upon the "Variation of Insects" (p. 227), he appears to have overlooked the not uncommon hybrid *Smerinthus ocellatus* × *populi* (Entom. v. 450; vi. 147; vii. 21). The late Fredk. Bond exhibited a hybrid *Clostera curtula* × *reclusa* before the Entom. Soc. Lond., Nov. 17th, 1873.—EDWARD A. FITCH; Brick House, Maldon, Essex.

PARASITES ON BUTTERFLY.—I caught a fine specimen of *Melanargia galatea* at Lulworth, about the first week in August, covered with about a dozen parasites, I understand of the genus *Trypodyctylus*. Perhaps your correspondents may have noticed if insects are more generally affected by parasites this year, or otherwise.—ED. PHILIP BELBEN; Bickleigh, Bournemouth West.

CICINDELA SYLVATICA, L., IN HANTS.—On August 7th I observed several specimens of this local species flying in the bright sunshine during the Review at Aldershot, doubtless driven up by the military movements. Not having a net with me, it was no use attempting to chase them, but while returning to North Camp Railway-station I managed to catch two with my hand, one of which, however, bit so furiously that it compelled me to relinquish it. This is probably the first time that the species has been recorded from the locality of Aldershot.—G. A. LEWCOCK; 73, Oxford Road, Islington, N.

SIREX GIGAS.—A fine specimen of this sawfly was captured at Bowes Park, flying in a garden, by my nephew, a very young collector, who brought it to me to be pinned out.—T. ROBINSON; Claysfield Terrace, Winchmore Hill, N., August 13, 1889.

SIREX GIGAS IN IRELAND.—A specimen of this sawfly was taken here on August 7th.—J. B. S. MAC SWAINE; Slandford House, Foxrock, Co. Dublin.

ATHERIX IBIS IN SHROPSHIRE.—While wading and fishing in one of the Shropshire brooks, in June last, I found a cluster of the flies *A. ibis* attached to a dead willow branch overhanging the stream, which at that point was flowing slowly.—C. R. BLATHWATT, West Ashby Vicarage.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—August 7th, 1889.—The Right Honourable Lord Walsingham, M.A., F.R.S., President, in the chair. The Rev. John Walley, of Wuhu, China, was elected a Fellow: Professor Charles V. Riley, of Washington, United States, was elected an Honorary Fellow in place of the late Dr. Signoret, of Paris; and Colonel Swinhoe and the Rev. F. D. Morrice were admitted into the Society. Mr. Walter F. Blandford exhibited a specimen of *Cardiophorus cinereus*, Herbst, taken at Tenby, and remarked that the species had rarely, if ever previously, been found in the United Kingdom. Mr. C. O. Waterhouse said he believed that there was a specimen in the collection of his late father, and also another specimen in the collection of the British Museum. Mr. Waterhouse stated that the British Museum had just received from the Rev. Arthur Elwin, of Hangchow, China, a luminous larva, about 1½ in. long and 3½ lines broad, which he believed to be one of the Lampyridæ. Lord Walsingham exhibited specimens of *Conchylis degreyana*, M'Lach., bred from seed-heads of *Plantago lanceolata* at Merton, Norfolk; also a specimen of Tineidæ allied to the genus *Solenobia*, probably belonging to *Dissoctena*, Staud., but differing somewhat in the structure of the antennæ. Lord Walsingham remarked that the specimen was taken by himself at Merton on the 31st July last, and that the species was apparently undescribed. Mr. Meyer-Darcis exhibited a collection of Coleoptera, comprising specimens of a species of *Loethrus* from Turkestan; *Julodis globithorax*, Stev., from the Caucasus; a new species of *Julodis* from Kurdistan; *Cardiaspis mouhoutii*, Saunders, from Sikkim; *Carabus smaragdinus*, Fisch., from Siberia; *Julodis ampliata*, Mars., from Aintab, Asia Minor, and a variety of the same from Kurdistan; and *Julodis luteogramma*, Mars., from Syria, and a variety of the same from Kurdistan. Mr. H. Goss read extracts from letters from Mr. R. W. Fereday, of New Zealand, and Sir John Hall, K.C.M.G., relating to a number of Lepidoptera recently collected at sea, about half way between the Raver Plate and Rio, at a distance of over 250 miles from land, in about 30° S. lat. and 46° W. longitude. It was stated that the ship was surrounded by swarms of moths. Mr. J. J. Walker, R.N., observed that he had seen a large number of insects at sea about 150 miles off the coast of Brazil, and he referred to other records of the capture of insects at sea in Darwin's 'Voyage of the Beagle,' and Dr. Coppinger's 'Cruise of the Alert.' The discussion was continued by Dr. Sharp, Lord Walsingham, Mr. White, Mr. Kirby, and others. Mr. E. Meyrick read a paper, entitled "On some Lepidoptera from New Guinea," and exhibited the species therein described. He stated that the specimens were derived from two sources, viz. (1), a portion of the collection received by the Society from Baron Ferdinand von Müller, F.R.S., and collected by Mr. Sayer when accompanying the Australian Geographical Society's Exploring Expedition; and (2), a number of specimens collected by Mr. Kowald near Port Moresby, and obtained from him

by Lord Walsingham. Mr. Blandford read a letter from Mr. Wroughton, of Poona, Deputy Conservator of Forests, asking for assistance in working out certain Indian Hymenoptera and Diptera in the collections of the Bombay Natural History Society. Lord Walsingham, Colonel Swinhoe, and Mr. Moore made some remarks on the subject.—H. Goss, *Hon. Secretary*.

SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—*July 25th, 1889.*—T. R. Billups, F.E.S., President, in the chair. Mr. R. South exhibited a fawn-coloured var. of *Argynnis adippe*, the black spots being represented by hyaline spots; also two vars. of *A. euphrosyne*; the var. of *A. adippe* and one of those of *A. euphrosyne* were received from a correspondent in Kent. Mr. West, specimens of *Apamea ophiogramma* taken in his garden at Streatham. Mr. R. Adkin, examples of *Selenia lunaria*, *Bupalus piniaria*, *Amphidasys betularia*, and *Odonopera bidentata*, bred from larvæ and pupæ received from Forres. Mr. Frohawk, pupæ of *Gonopteryx rhamni*, and called attention to their resemblance to young birds; also living larvæ of *Nemeobius lucina*. Mr. Wellman, bred series of *Sesia tipuliformis*, *S. myopiformis*, *S. formiciformis*, and *S. musciformis*; the last-named bred from pupæ from the Isle of Man. Mr. Auld, three specimens of *Callimorpha hera*, var. *lutescens*, bred from ova obtained from a female of that variety taken in Devon, 1888. Mr. J. T. Williams, an example of *Arctia caia*, the red colour of the inferior wings being replaced by orange. Mr. T. R. Billups, six out of the seven species of social wasps indigenous to this country, viz., *Vespa crabro*, *V. vulgaris*, *V. germanica*, *V. rufa*, *V. sylvestris*, and *V. norvegica*, and read notes relative to his exhibit. Remarks were made by several members on the failure this year of sugar to attract moths, and a discussion as to the cause of this ensued.

August 8th, 1889.—The President in the chair. Mr. Dawson exhibited a specimen of *Deilephila livornica*, taken in the neighbourhood of Plymouth, 1888; a melanic form of *Tæniocampa incerta*, taken at Plumstead; two vars. of *Folyommatus phlæas*, one being the var. *schmidtii*, taken at Plumstead. Mr. Carrington said he only knew of three or four examples of this var. having been taken during the last ten or fifteen years. Mr. Tugwell remarked that he did not altogether agree with Mr. Carrington that *schmidtii* was so rare; he thought that in nearly all the principal collections there were forms approaching this variety. Mr. Dennis showed forms of *Bryophila perla*, including several yellow specimens, and one having the superior wings almost entirely suffused with black. Mr. R. Adkin, a specimen of *Chærocampa porcellus*, bred from a larva found last year, and which was put in a box without any earth, and had spun a cocoon some way from the bottom of the box within which it pupated. Mr. Joy, a var. of *Epinephela hyperanthes*, having the spots on the under side unusually large. Mr. Turner, a larva of *Dicranura vinula* affected by some disease which Mr. Tugwell said seemed to be the result of a fungoid nature. Mr. Billups, a female example of *Bracon roberti*, taken in his garden at Peckham; also series of *Ascogaster varipes* (both sexes) and *A. instabilis*, and read notes; also galls on *Salix herbacea*, and their maker *Mematus herbacea*. The Secretary, on behalf of Mr. T. D. A. Cockerell, two galls, found at West Cliff, Colorado, on the wild rose, viz., *Rhodites bicolor*, and the fly bred from the other Mr. Cockerell proposed to call *Rhodites rosafolii*, n. sp. A communication was also read from Mr. Cockerell on "Bees and Poppy Flowers."—H. W. BARKER, *Hon. Sec.*

FREDERICK BOND.

Born, February 22nd, 1811.

Died, August 10th, 1889.

AGED SEVENTY-EIGHT YEARS.

THE ENTOMOLOGIST.

VOL. XXII.]

OCTOBER, 1889.

[No. 317.]

INVESTIGATION OF VARIATION.

BY THE EDITOR.

DURING the past few years great strides have been made towards a better knowledge of the range of variation in insects. A decade ago the number of students of this interesting subject could be counted by units; their ranks now include many, in all parts of the world. It is highly satisfactory to find that latterly there has arisen such an appreciation; and much has recently been done towards a discovery of the causes of variation of colour and shape of animals, beyond the generally accepted one of "adaptation to the environment." This is, of course, satisfactory so far as it goes; but as yet the whole knowledge on the subject is very small, in comparison with that which has still to be attained.

Every credit is due to those who have done much towards unravelling the tangle, but that much is little; and, after all, it is only individual effort. Individual action, although of the first necessity, rarely brings forth results commensurate with the individual labour bestowed upon a little known subject. The total material available to one person, unless in very exceptional cases, is rarely sufficiently exhaustive to enable exact facts to be attained. Again, the publication of such facts must be intermittent and in various channels, which may after lapse of time become overlooked, so causing unnecessary labour in going over already trodden paths. To publish such facts in large form is expensive, when properly illustrated, and generally a tax upon the author, the demand for his book being confined to the limited number who take an active interest in his work. Thus his chances of disseminating his hard-won knowledge are fettered. Further, his facts published, after all his trouble and expense, may not be the best facts which he possesses, or best arranged for the advancement of knowledge. Some one else may have other facts, which, if incorporated, would greatly enhance the value of the work.

ENTOM.—OCTOBER, 1889.

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Only men of leisure and means can hope in this wise to succeed. The professional naturalists, who gain their whole knowledge in museums, are either partially occupied in studying variation, or fail because they have only the dried specimens to deal with, and are without much knowledge of the surroundings in which the animals lived.

The answer to all this is in properly regulated co-operation of the workers. In this number of the 'Entomologist,' Mr. T. D. A. Cockerell concludes his very excellent series of papers on "Variation of Insects." In his last paragraph he invites opinion upon the establishment of a committee in London, for the collection and editing of all possible material upon the subject of variation of insects. This is a good suggestion, so far as it goes, but it is imperfect. His mode of election would not, it is to be feared, come out well, and be too irresponsible. Properly carried forward, the work of the proposed committee would be very heavy and most onerous. Experience of such committees is, that they get along pretty well for a time and then get lax, or collapse altogether, from the fact that what is everyone's business is that of no individual.

The right course seems to be to establish a properly constituted association of those who work actively, and others who take a passive interest in the subject. The former, as in all societies, will naturally be elected to the management of the affairs. This association should not confine itself to the study of variation of any particular group of animals, because the causes which operate upon one, probably do more or less upon another. The council might, however, nominate from the whole body of members, including themselves, sectional committees to deal with the various orders, with one general committee to revise the whole. Honorary work is good, where it is impossible to afford other. It is very unlikely, however, that assistance of that character can be obtained for the actual drudgery of searching throughout the voluminous literature of all countries, in the past, as well as that current. Such will have to be paid for, which, with publication and other expenses, would require a considerable income. Now, can such a society be established? Are there a sufficient number of students of variation to support such an association?

The whole scheme is well worthy of consideration, and should be threshed out. Any of our readers who would care to send their opinions for publication, or their names, to the editor of the 'Entomologist,' with the object of preliminary consideration, will be communicated with, and, if possible, a meeting arranged for discussing what can be done. The entomologists might found the society, and afterwards invite students in other orders to join. It might be called the "Society for Investigation of

Variation," or any other name; the shorter the better. It should be international in its operations.

JOHN T. CARRINGTON.

London, September 21, 1889.

ON THE VARIATION OF INSECTS.

By T. D. A. COCKERELL.

(Concluded from p. 229.)

THE phases of variation, briefly described in the previous parts of this paper, will probably be found to include most of those to which insects, and especially Lepidoptera, are liable. At present, and in the limited space of a magazine article, it is impossible to treat the subject in any degree of completeness, so I trust that omissions of many important and well-known varieties from the list will be forgiven. Under colour-varieties, those occurring in the Coleoptera are well deserving of lengthy treatment, such as the variations in the metallic colours of the Carabidæ, the markings of the Coccinellidæ, the colours in *Donacia*, &c. Mr. T. H. Hall has kindly sent me some very interesting notes on the variation in British Coleoptera, from which I select the following, as illustrating the principal phases of variation to be noted:—

"Pterostichus.—It is very noticeable that many species of this genus vary from black to brown or testaceous; the light specimens seem chiefly to occur, in my experience, under stones, &c., in winter. I put them down as immature. *Harpalus æneus*, F. (*proteus*, Payk.).—Varies from a brilliant metallic shining green insect to one quite dull and brown, with the slightest sheen of green on its elytra; the dull variety seems somewhat local, and occurs in singles; some specimens are rich bright coppery colour; the variation is in colour of elytra, the thorax, &c., being green, but varying in brightness. *Coccinella variabilis*, F.—A strikingly variable species; there is a dark and variable variety, with yellow spots; there appears to be a uniformly parallel variation of thorax and elytra. *C. 11-punctata*, L., and *C. 7-punctata*, L.—Vary in size and definition of spots on elytra; the light coloured ones have smaller spots than the dark ones. *Typhæus vulgaris* (= *typhæus*, L.).—Is very variable in size and appearance; out of a number found in one locality no two are alike; the female varies in rugosity of front of thorax; in the females the thorax is produced into horns of variable size; there is a variety of male and female which is brown instead of black. *Callidium violaceum*, L.—Amongst many specimens found at Wormwood Scrubs, London, the males, which are of much

smaller size than the females, are purplish metallic in colour, and the females bluish or violet. This may be a local variety of a male imported in the timber posts, in which I found it. *Donacia sericea*, L.—Is most variable; I have not a pair alike in colour of both sexes; cannot remember seeing a pair in which male and female were alike in tint, coupled. I have pairs as follows:—

- | | |
|---------------------------|------------------|
| 1. ♂, violet, paired with | ♀, coppery. |
| 2. ♂, black | ♀, coppery. |
| 3. ♂, bright green | ♀, brassy. |
| 4. ♂, deep purple | ♀, bright green. |

In Rhyncophora, the various species of *Polydrosus*, *Strophosomus*, *Hypera*, &c., vary greatly from dark to light specimens.”—(T. H. Hall, in *litt.*, July 23, 1889.)

Calosoma wilcoxi, an American species, presents an interesting variety, as I learn from Dr. John Hamilton. The type is a very green insect, with the margin of the thorax and elytra golden; but Dr. Hamilton found a specimen in which the green was replaced by purple-black, and the golden by purple-blue.

With regard to the Hymenoptera, Mr. Ashmead has kindly written me as follows:—“The dimorphic forms in the Cynipidæ are nearly always paler than the sexual forms, *i.e.*, honey-yellow, brownish yellow, or reddish-brown; the sexual form usually being black or brown. Cynipids, placed in the genera *Biorhiza* and *Acraspis*, comprise only females of some unknown sexual form, so that it must be the females that depart from the original type, and not the males. The female cynipid certainly cannot represent the ancient type, *i.e.*, the agamic form cannot, as it is a degraded form, and necessarily must be the result of some change in environment—either climatological or food-supply. As far as my observations go, it is usually the female hymenopter that is the most variable, and the male the most persistent, although my observations are too meagre to generalise upon.”—(W. H. Ashmead, in *litt.*, April 21, 1889.) These observations are exceedingly interesting, as bearing upon the question whether the male or female is usually the oldest type in insects.

In previous parts of this paper, I have referred to the so-called “hermaphrodite” insects (Entom. 26), and objected to the term hermaphrodite as used in this sense. Mr. Jenner Weir has written in reply to some of my objections:—“I quite agree with you that, properly speaking, the word hermaphrodite should be more restricted in its meaning; but you must recollect that it means a union in one individual of the attributes of Venus (Aphrodite) and Hermes (Mercury); not, therefore, as you say, a functional bisexual animal.” Nevertheless, the term is commonly used in zoology to mean a functionally bisexual animal, as, for example, a snail (*Helix*); and if we are to call the apparently bisexual Lepidoptera hermaphrodites, we must have a new term

for the truly bisexual forms, an arrangement which will scarcely be conceded by zoologists. It remains, then, to find a suitable term for our pseudhermaphrodite insects. Mr. Jenner Weir (*in litt.*) has alluded to them as "biformed." I would suggest, however, that the term "*biformed*" be used for varieties combining two forms of one sex, as I have described under "g" (Entom. 6), and that the pseudhermaphrodites be known as "*intersexual*" forms.

Dr. John Hamilton (*in litt.*, July 27, 1889) has sent me some very interesting remarks on variation in size in Coleoptera, as follows:—"Assimilation power has certainly much to do with it, where the supply of food is unlimited; as, for example, I am rearing *Balaninus*, and I find the same species varying in size from .15 inch to .33 inch, bred from very large acorns, where all the larvæ in an acorn (from one to five) went into the ground before the whole acorn was consumed. And, again, in raising Longicorns and other beetles from wood, where all the larvæ have apparently an ample supply, it must be individual difference in power of assimilation that produces such great differences in size as often occur. But this will not altogether account for racial differences, or differences of a geographical character; as, for example, *Prionocyphon discoideus*, Say, is .20 inch in length, and all the examples found in some locality will be about that size, but in a neighbouring locality, not perceptibly different, all found will not exceed .15 inch. Again, *Uloma punctulata*, as found here (Allegheny, Pa.), is about one-fourth longer and wider than the specimens from Florida and Georgia."

And now, in conclusion, I would appeal to *all* entomologists to take careful note of the varieties they meet with from time to time, and especially the conditions under which they exist. If I may make a suggestion in the matter, it is that a small committee be appointed in London to receive and edit descriptions and reports of varieties from all parts, and prepare a summary of them for publication in the 'Entomologist.' At present the records are scattered, and most of the finds remain unpublished; but how interesting it would be if we could have careful reports compiled from hundreds of records, such as "Melanism in 1888," "Comparison of size of northern and southern insects"; and so on through the whole imaginable series. The benefit to science from such an arrangement would be *immense*, and it would be easy to do it. Let the readers of the 'Entomologist' nominate their committee, and let the committee get about their work without delay. A month lost can never be regained. What does the editor say?

West Cliff, Colorado, U. S. A.

ENTOMOLOGY OF ICELAND: NOTES UPON A VISIT IN 1889.

BY THE REV. F. A. WALKER, D.D., F.L.S., &c.

(Continued from p. 225.)

ON July 23rd I visited the "Phlegræi campi" after breakfast. Here may be seen three or four solfataras at intervals of about 200 yards, and a rocky cauldron of ever-seething, slopping, bubbling and boiling grey mud, resembling lead paint. There are more solfataras on the other side of the hill. This mud cauldron is said to be thirty feet deep; and it is a characteristic of all the hot and steaming pools in this formation, here and elsewhere, to be of great depth, often ninety feet and upwards. There are, likewise, rounded beds of sulphur, mud, and ferruginous deposit, which will not bear the weight of anyone attempting to traverse their heated crust. The rivulets from the hot pools wend their way through deep banks down the valley, leaving oxide of iron on the stones in the bed of the stream and on their margin in their course. My friends started in advance of me about noon to ride as quickly as might be on their return journey to Reykjavik, guided by the farmer who had escorted us on the preceding evening as far as Hafnafiord. I followed them a little after 2 o'clock, but a perfect storm of wind and rain set in, and continued all day, accompanied by hail on the top of the hills, where wind ensued of such force as to cause us to swerve on our ponies. We took the near but very steep road on the hill, with a slope of loose lava, like a colossal ash-pit, of 100 feet or upwards on our left and 50 feet on our right, and after a deep descent passed by a volcanic lake on our left. This route brought us back into the homeward road by a somewhat shorter cut. During this expedition I gathered some leaves of an alpine plant, the *Rubus chamæmorus*, or cloudberry, which I had not seen for many a long year. Thoroughly wet through, chilled, and shivering we reached Hafnafiord late in the evening; and, after remaining some time there to rest and take refreshment, arrived at Reykjavik after midnight.

Early on the morning of July 29th we anchored off Patreksfjordur (lat. $65^{\circ} 35'$, N., long. $23^{\circ} 57'$, W.), on the west coast of Iceland. This is a very neat little place, but consisting only of a few scattered houses along the shore, and immediately at the base of steep and lofty hills, whose slides of lava-shale extend almost to the beach. After landing here I spent an hour or so in collecting Coleoptera, of which I found several under stones in a field adjoining the beach.

On resuming our voyage the same morning, at 11 o'clock, we pass table-shaped hills, of which the upper portion consists of

rocky ridges, and the lower of slopes of shale, frequently variegated by strips of greensward, alternating with red tufa, which is in its turn succeeded by loose grey basalt. The same description of scenery continues for a considerable distance; and on the tops of the hills, as previously, frequent patches of snow occur. Of course its total disappearance, or the contrary, varies according to the warmth of the summer season in different years. This summer, and the last one also, are considered to be very fine ones for Iceland. Arnarfjordur (lat. $65^{\circ} 41'$, N., long. $23^{\circ} 35'$, W.) was next reached, or, more strictly speaking, Bildudalur, as this is the name of the head of the bay in the said fjord in which our vessel anchored, from the establishment of a thriving Icelandic merchant there; in fact, his dwelling, factory, cottages, and homestead constitute the whole of the place. As his wife was one of our passengers up to this point, he came off to the steamer in his boat not long after our arrival. I observed very few Coleoptera under stones at Arnarfjordur. Geometridæ, on the other hand, proved plentiful on either side of a wall that divided the sloping meadows here, as well as along the banks of a watercourse from the hills. I caught probably three or four species, but the large majority belonged to one kind.

The plateau of Glama glacier meets our view far ahead as we approach Dyrafjord (lat. $65^{\circ} 53'$, N., long. $23^{\circ} 28'$, W.) on July 29th. The summits of the snow-streaked hills adjacent to the shore terminate in more pointed peaks, and have generally a more alpine appearance. The houses of Dyrafjord are scattered along the line of coast, and are chiefly of wood, painted brown, with roofs of shingle. I went ashore in the evening, and found Geometridæ very abundant.

On July 30th we reached Isafjordur (lat. $66^{\circ} 6'$, N., long. $23^{\circ} 7'$, W.), after visiting several other places. The clouds hung low upon the mountains next morning. The heights that environ the head of this fjord sweep more gradually to the shore than is by any means always the case in these regions, and terminate in grassy slopes, on which cattle were feeding. Geometridæ are decidedly scarce here, at least on the particular mountain slope that I visited when I went ashore that morning, probably owing to the dearth of flowers in that spot, for the day turned out a beautiful one, warm and sunny.

Mr. Hugo Ruben, from Copenhagen, one of our fellow-passengers, was the companion of my walk this morning, and kindly assisted me in collecting a few Coleoptera. The scarcity of flowers—very few besides gentians, wild thyme, and cotton-grass—was very noticeable at Isafjordur, owing no doubt to its northerly position.

Reykiafjordur (lat. $65^{\circ} 58'$ N., long. $21^{\circ} 27'$ W.). I came on deck at 6 a.m. on August 1st, just as we were passing Cape North,

the north-west point of Iceland, at the distance of a mile and a half from the shore, and within the arctic circle. The cliffs of Cape North are not very lofty, but precipitous, and going down sheer into the sea, completely flat-topped, and with clouds brooding low upon their summits. These heights are mostly of a grey tint, with red and brown patches here and there, without fissures, ravines, or projecting points, but presenting a uniform wall of rock, with ledges of greensward seawards. A short distance eastward, where the greensward dips into a hollow, and the cliffs are lower in consequence, there are two places where two waterfalls respectively leap over the brink into the sea, descending from the Dranga glacier. A thick fog over the sea prevailed for a considerable time this morning, but the weather became clearer after mid-day, about which time we entered Reykíafjörður, whose inhabitants are said to be the poorest in all Iceland when the ice-floes prevent them from betaking themselves to their lucrative fishing-grounds, and great hunger and distress prevail; but they are correspondingly thriving when they can pursue their ordinary avocation, so completely does their subsistence depend on their fisheries. Reykíafjörður is small and narrow compared with other arms of the sea, and its village similarly consists of very few houses. A few Coleoptera are to be obtained by searching under stones; but though there are decidedly some flowers and more varied kinds of plants than at Ísafjörður, I saw no Geometridæ whatever, and only one *Crambus* and one *Phrygania*. My own idea is that we have passed the limit where most species occur, and are now too far north to meet with many. The said limit I should be inclined to place between Innuundafjörður and Ísafjörður, possibly somewhere about fifty miles south of the arctic circle. Some inmates of a house, where we were invited to sit down, and given a draught of good milk shortly before our return to the steamer, attributed the absence of insects to the day not being a sunny one, and stated that there had been several moths. Part of yesterday at Ísafjörður, however, turned out very fine and warm during my walk, yet I did not see half a dozen Geometridæ; and of course certain species must have their limit somewhere, as in our own land,—a limit traceable to climate, and not always depending on the food-plant (as though the insect cannot continue to exist apart from the food-plant, yet the food-plant may be found without the insect). I gathered a species of grass new to me this morning. At Reykíafjörður may be seen many barrels and vats for holding the whale-oil, also large sections of whalebone from the animal's palate, and large masses of blubber drying in the sun, round which several specimens of *Calliphora vomitoria* were buzzing, and others lying lifeless on their backs on the surface of the blubber, either from their wings and legs having become clogged with the oil (and this is the most

probable supposition), or from the ammonia in the flesh of the whale being too strong, even for what are ordinarily regarded as scavenger-flies.

Fog-horn sounding early on the morning of August 2nd, and a smart shower of rain, at Skagestrand (lat. $65^{\circ} 50'$, N., long. $20^{\circ} 18'$, W.), at which place the hills recede from the coast, are smaller in dimensions, and consisting of far more gradual and easy means of ascent, being for the most part grassy slopes, as far as I can judge from the steamer. The clouds are still resting on their summit. Skagestrand apparently only consists of a dozen or so farms or cottages, scattered here and there over a level green plain adjacent to the sea, and in front of the hills. As it was a damp and foggy morning, and our stay here only a short one, I did not land. About 9 a.m. we are again on our way towards Saudakrog (Saudakrok in Icelandic) (lat. $65^{\circ} 45'$, N., long. $19^{\circ} 38'$, W.), but continue to proceed very slowly in consequence of the fog. Drangey, so famous as the place of residence of the hero Grettir and his brother, and their death at the hands of their foes, is a rocky mound of an island, with precipitous cliffs on every side, seemingly impregnable, had not the ladder, according to the Saga, been left in position against the rocks, whereby his enemies scaled the place. It is now uninhabited, but is productive as regards the number of sea-birds in it, and the fish around. A little further away the large island of Malmey is passed, where Malmey, an outlawed bishop, who had been driven by his enemies from the land, resided; and his retainers, in retaliation, killed them at Holar, his old episcopal seat of residence, about A.D. 1300, being as fierce as his enemies themselves in those wild times. The cliffs of Drangey are whitened all over in many places with the guano of sea-birds, and in close proximity to them stands a pointed, insulated rock, known as the "Old Man"; it is said there was another in its vicinity, termed the "Old Woman," which has long since fallen into the sea. Saudakrok presents a very neat appearance, and extends along the sea-beach, with gradually sloping cliffs, or, more strictly speaking, steep banks, with their surface everywhere strewn with shale and loose stones. On landing, I strolled up the bed of a dry watercourse, where I collected some of the stones, being struck with the variety of their colour and markings. Arrived at the moor above, I found it covered with stones, grassy hillocks, and an abundance of the plants of *Dryas octopetala*, by this time all gone to seed; captured one Noctua on *Thymus serpyllum*, and obtained some Coleoptera under stones; also some *Calliphora*, then in a semi-torpid state, that had crept there for shelter from the damp weather. Three Geometridæ also seen.

(To be continued.)

CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES
OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.

By J. W. TUTT, F.E.S.

(Continued from p. 233.)

Mamestra, Och., *brassicæ*, L.

The type of this excessively abundant and widely-distributed species is described by Linnæus, in the 'Systema Naturæ,' 10th edition, p. 516, No. 111, as follows:—"Noctua spirilinguis cristata alis depressis cinereo nebulosis: unco nigro supra maculam priorem." In the 12th edition, p. 852, No. 163, he adds, "Stigmata alæ ordinaria punctis albis notata et margo inferior punctis 3 albis." It must be noted that no mention is made in the Linnæan description of a subterminal line, and mention is made of three white dots on inner margin. My specimens have one or two of these dots present, not three, and I have specimens in which the subterminal striga is practically obsolete; the "uncus" is well seen around the claviform, and there are traces in some specimens of another around the lower part of the orbicular. It would appear that we rarely get specimens satisfying the Linnæan description of the type, our specimens being principally referable to var. *albicolon*, St. Guenée, in his 'Noctuelles,' vol. v., pp. 198, 199, says of the variation of this species:—"It varies a little both in colour and markings, but I have never seen a distinct race. *Albidilinea* of Haworth has the reniform and subterminal line well marked in white; *Albicolon* of Stephens is, on the contrary, of mixed colours, with the claviform obliterated; lastly, the figure *d* of Engramelle has a yellow ochreous tint. These last specimens are generally smaller than the type." Regarding this ochreous form, Mr. Dobrée has specimens, a description of which he has kindly given me (*vide* var. *ochracea*). In England we appear to get three fairly distinct forms:—(1) Ashy grey, mottled with darker on the costal margin and with ochreous on the inner (the ochreous often with a reddish tinge), with distinct stigmata and subterminal line, = var. *albicolon*, St. (2) An almost unicolorous blackish grey form, with all markings and lines, except reniform, almost obsolete, = var. *unicolor*. (3) An intensely black form, with very distinct white subterminal line and reniform, = var. *albidilinea*. Hübner figures (88) the pale form under the name of *brassicæ*. Mr. Gregson, 'Entomologist,' iv., p. 52, writes:—"Of this constant and abundant species I dare not say how many I have carefully secured, and the results are before me:—One very small perfect specimen; one of a smooth rich brown colour and without markings, a large specimen; and two large females having full white stigma, and a rich, distinct, wavy, light striga near the outer edge. These are very striking

insects." I have a very small specimen, but have never seen one that could be called really brown, so that Mr. Gregson's specimen must have been a very unusual form. Taking the mottled grey insect as the type, we have the following forms:—

1. Ashy grey, mottled with darker, no ochreous colouring, white reniform, subterminal line more or less obsolete, = *brassicæ*.
2. Grey, mottled with ochreous, distinct stigmata and subterminal line, = var. *albicolon*, St.
3. Ochreous grey, mottled with darker, white reniform, subterminal line present, = var. *ochracea*.
4. Unicolorous blackish grey, white reniform, obsolete subterminal line, = var. *unicolor*.
5. Very black, white reniform, white subterminal line, = var. *albidilinea*, Haw.

α. var. ochracea, mihi.—This is the fig. *d* of Engramelle, 456. Hübner's figure (88) may be described as:—"Anterior wings pale ochreous, with darker fuscous shades; all the characteristic lines and markings of *brassicæ* of a pale whitish ochreous. Hind wings grey, margin darker than base, lunule distinct." None of our British specimens appear to be referable to this variety. Mr. Dobrée, however, writes:—"I have specimens from Amurland, where it is very common. These are of quite a pale, warm ochreous ground colour, with typical faint markings. Reniform white, and more compact than in British specimens, and outlined with black. Orbicular, the same as ground colour, with strong black outline, and beneath the orbicular a conspicuous semicircular black mark facing inwards; the subterminal line almost obsolete" (*in litt.*).

β. var. albicolon, St.—This would appear to be the more common form of *brassicæ* in the southern part of England, being mottled with ochreous and dark fuscous, and with distinct stigmata and transverse lines outlined in pale ochreous. Stephens' *albicolon*, however, had an "obliterated claviform," which is not usually the case with the mottled variety.

γ. var. unicolor, mihi.—Anterior wings dull blackish grey, with the subterminal line almost obsolete, the markings, blending with the dark ground colour, give it a very unicolorous appearance. The outer edge of the reniform white, as in the type. My specimens are labelled Nottingham and Westcombe Park, but I dare say it is found occasionally wherever the type or var. *albicolon* is abundant.

δ. var. albidilinea, Haw.—Haworth's description of *albidilinea* is as follows:—"Alis anticis nigricantibus, striga postica alte bidentata albicante." "Statura et magnitudo fere *N. brassicæ*. Alæ anticæ stigmatibus ordinariis, strigæque alte dentatâ juxta marginem posticum albicante, exacte ut in Noctuis vulgo dictis 'Brocades.'" This extreme variety is, I believe, rare. I have only one of this intensely black form with distinct white markings. My specimen was bred from pupæ, sent me by Mr. Mottershaw, of Nottingham. Mr. Robson, in the 'Young Naturalist,' vol. ix., p. 103, referring to Mr. Gregson's specimens, mentioned above, describes them, and I have very little doubt they belong to this variety. I have seen a specimen of Mr. Robson's belonging to this variety, but the subterminal line is more ochreous than white. I would include all black specimens with strongly-marked reniform and subterminal line under this varietal name.

z. var. *andalusica*, Stdgr.—Dr. Staudinger has a variety in his 'Catalog' under this name, which he describes as, "dilutior, magis unicolor." I thought that probably this variety might refer to my var. *ochracea*, as this short description is so vague that it is impossible to tell from it to what form Dr. Staudinger refers. Mr. Dobrée, however, in answer to a query, writes:—"Andalusica is certainly not the Amur type. It is merely the pale form so constantly occurring in all continental, as opposed to British, Lepidoptera, the ground colour of the Amur type (*vide* above) is ochreous, but that of *Andalusica* is grey" (*in litt.*).

Mamestra, Och., *persicariae*, L.





This species, as far as my knowledge extends, appears to be very constant in Britain. I find a slight variation in the amount of ochreous colour in the white discoidal, some variation in the extent of the orbicular being obsolete, and rather more in the character of the subterminal line. I have some in which this latter is obsolete, others in which it is represented by a more or less complete series of ochreous dots, and one only in which it is quite complete. On the Continent, however, it appears to be more variable, at any rate, so far as the discoidal is concerned; in some specimens it is ochreous, and in others only of the ground colour. The former is, according to Guenée, the *accipitrina* of Esper, the latter the *unicolor* of Staudinger, although, as mentioned below, Dr. Staudinger considers *accipitrina* a distinct species. The type of this species is described by Linnaeus, 'Fauna Suecicae,' pp. 319, 320, No. 1208, as:—"Noctua spirilinguis cristata, alis fusco-nebulosis: macula reniformi albo papilla lunari flavescens." "Alae superiores fusco nigricantes, venis nebulosae, margine postico quasi dentato atomis albis. Inferiores antice pallidae, postice fuscescentes margine albedo. Subtus omnes glaucescentes: fascia lata, obsoleta et puncto nigro. Anus ferrugineus"; and in the 'Systema Naturae,' p. 847, we read, "Alarum superiorum margo posticus albo-dentatus." Our specimens have an ochreous subterminal line, not "white."

z. var. *accipitrina*, Esp.(?)—Of this variety there are specimens in the Doubleday collection (continental), with "the reniform ochreous, and the whole insect much less strongly marked." Guenée says of it:—"Accipitrina, Esp., pl. 129, fig. 4, appears, after what he himself states in his text, to be a purely accidental and very singular variety of *persicariae*." Dr. Staudinger, in his 'Catalogue,' says:—"Accipitrina of Esper is another species, the var. *accipitrina* of collections is not Esper's *accipitrina*." He then suggests for the *accipitrina* of continental cabinets the varietal name of *unicolor*.

β. var. *unicolor*, Stdgr.—Of this variety, Staudinger says in his 'Catalog,' "Al. ant. absque macula alba." Mr. Dobrée writes:—"I have specimens of this variety in my collection. It seems to be a common continental variety" (*in litt.*).

APAMEA, Och.

The genus *Apamea* brings us face to face with the great difficulty of dealing with our *Noctua* varieties, for in this genus

we have the first of those protean species where the ground colour varies through several shades of colour, and where the markings are so variable, and yet recurring with such frequency in the various forms, that it is no wonder our early lepidopterists thought they had many distinct species. Taking the first two species, *basilinea* and *pabulatricula*, we have two of the most constant species in the genus, *basilinea* being ordinarily characterised by no special markings, but being generally of an almost unicolorous hue with transverse lines, while *pabulatricula* is characterised by a strongly-developed black longitudinal mark directly under the stigmata. The two forms—represented by these species—give a basis on which the development of the variation in the other species appear to proceed, viz., (1) an unicolorous form with transverse lines, and (2) a more variegated form with a dark longitudinal streak under the stigmata. The species of this genus may be looked upon as having the anterior wings divided into three parts,—the basal area, the median area, and the outer area. The first and last of these have transverse lines crossing them, the second contains the stigmata, and under this, in some species, is a very dark longitudinal -shaped mark (a modification of the claviform). These may be looked upon as the great characters of the variable members of the genus, the variation consisting principally of the development (in some cases to a very high degree) or non-development of this particular mark. Thus, in the variable species *gemina*, we find all the different phases of variation to consist of two types: one, in which the transverse lines are developed, and the species has a particularly reticulated appearance; the other, in which the -shaped mark is highly developed, the transverse lines more or less suppressed, and the median space more or less intensified in its upper half in colour. But just as *basilinea* and *pabulatricula* exhibit single forms of a different type, and *gemina*, on the other hand, exhibits these types blended into one with intermediate forms, so we have in *unanimis* an almost purely dimorphic species, where one form is reticulated and the other with the -shaped mark, and yet there is no extreme development of either form, as in *gemina*. We now come to another constant member of the group,—*ophiogramma*,—with its characteristic dark costal mark, and then we reach, what appears to me, to be the most aberrant* member of the group, *leucostigma*, where the transverse lines are reduced to a minimum, where the  mark is rarely developed, but where we get a perfectly new form of variation,—a dark unicolorous form with no markings whatever, except the variable yellow or white reniform stigma. And then comes *didyma* (*oculea*), one of the most protean species

* This is an *Apamea*, undoubtedly, from its markings, but the shape of the wings is different to the other members of the group. It appears to have close characters with *Hydracia*.

in the whole group, and it is almost impossible in this species either to classify or tabulate the numerous forms, for not only have we every possible variety that can be compounded of the *basilinea*- and *pabulatricula*-like forms, but these are combined with *ophiogramma*-like forms with a result that defies classification: we have in grey, ochreous, and red colour the transverse lined or reticulated form; we have in each colour the M -marked form; we have in each colour an *ophiogramma*-marked form (dark costa), blended with the other forms of variation into every possible intermediate form; and, lastly, we have the unicolorous *leucostigma*-like forms in grey, red, and black.

Apamea, Och., *basilinea*, Fab.

This species is very constant in its markings for a member of such a variable genus, but the ground colour varies from a pale whitish ochreous, with transverse lines and stigmata still paler, to a deep, almost unicolorous, reddish brown form, some specimens being of the pale or a darker ground colour, with the median area reddish, the other parts of the wings being also suffused. This intermediate form would appear to be the type from the description of Fabricius, which is as follows:—"Noctua cristata alis deflexis fuscis griseis undatis, lineola baseos atra, thoracis crista bifida." "Color variat ferrugineis griseisque, distincta lineola parva flexuosa atra baseos. Antennæ albidæ." Guenée ('Noctuelles,' vol. v., p. 206) mentions an allied species under the name of *finitima*, which Mr. Dobrée assures me is only a climatic variety of *basilinea*. It would appear that this species is subject to a good deal of colour variation, according to its geographical range, as the Huddersfield and Hartlepool specimens are generally somewhat different in ground colour to the South of England forms.

a. var. pallida, mihi.—Ground colour of the anterior wings pale ochreous grey, not "fuscous," with still paler transverse lines, and no ferruginous or reddish clouds, otherwise like the type. The palest form I have seen of this species came from Mr. Russ, and was captured at Sligo.

β. var. unicolor, mihi.—The ground colour of a dark reddish brown, with a slight purplish tint; the orbicular scarcely traceable; the reniform indistinct, but outlined in a slightly paler hue than the ground colour; the subterminal line just traceable. Hind wings very dark grey, nervures dusky, lunule indistinct. Captured in Westcombe Park, June, 1886. Mr. Porritt writes:—"Reddish brown forms occur not uncommonly at Huddersfield, quite different to the southern clay-coloured specimens" (*in litt.*); and again he writes ('Transactions of Yorkshire Naturalists' Union,' part vi., p. 76), "I have taken some very beautiful strongly-coloured specimens at Huddersfield"; so that what would appear to be a very unusual form in the London district is closely allied to the ordinary one at Huddersfield.

γ. var. nebulosa, Vieweg.—Vieweg, in his 'Tabellarisches Verzeichniss, &c., pl. i., fig. 6, figures a variety under this name. It has "The anterior

wings pale ochreous grey, with the costal area reddish, the red colour extending half-way across the wing from the base to the reniform, and then going off to a point at the costa; the characteristic basal streak of *basilinea* is present, and there is a double black basal line; claviform and reniform outlined in black, but orbicular indistinct; lower half of reniform dark. Hind wings dark grey, with paler base and darker nervures." Vieweg's diagnosis, p. 55, No. 84, is:—"Cristata, alis deflexis cano fuscoque variis, litura baseos marginisque tenuioris nigris." In his further description in German we find:—"The lower part of the outer reniform filled up with blackish shading. Besides the black streak on the fold there stands close to the inner margin, about the middle of the wing, a small narrow spot of the same colour, which forms a chief mark by which this moth may be recognised."

♂. var. *cinerascens*, mihi.—Anterior wings of a dull ashy grey, with no trace of the ferruginous markings of the type; the subterminal line of a paler shade of the ground colour; the double basal lines and stigmata of the ground colour, outlined in brown; the reniform internally edged with paler. Hind wings of the same dull colour as the anterior. I have seen no specimens like these, except from Hartlepool. Mr. Robson sent me six specimens, of which three were typical, and three of this dull, almost unicolorous, form. Probably this variety is widely distributed in the most northern parts of Britain.

♀. *finitima*, Gn.—Guenée (as mentioned above) considers this as a distinct species, and writes:—"This replaces, in the United States, our *basilinea*, which it closely resembles. It is of the same size; the ground colour of the superior wings less reddish, and more white; the median space is, on the contrary, more strongly marked with reddish brown, especially on the upper part; the median lines are more strongly marked in black, as well as the claviform, which is very distinct." Mr. Dobrée, to whom I am so greatly indebted for information, writes:—"The *Hadena finitima* of North America is only a climatic variety of *basilinea*. The chief differences are that the general colour is of a pronounced vinous tinge; in some the space between the median lines is darker, so as to make a distinct band across the wing, which includes the stigmata; in others, the dusky line, from the stigmata to the inner margin, is more pronounced than in the generality of English specimens. In support of my belief, I have collected numerous specimens from English localities, and in some few of them, especially from Yorkshire and Newcastle, both the vinous tinge, as well as the distinct band of the North American insect, is quite perceptible" (*in litt.*).

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

LEUCOPHASIA SINAPIS.—I have captured many specimens of this species during June. *Melanarge galatea* was to be had in the district, but seems confined to a very small area.—(Mrs.) M. CRASKE; Newacott, Bridgerule, Holsworthy, Devon, August 26, 1889.

COLIAS EDUSA.—This butterfly has not been uncommon during the past year, and several records have from time to time been received of its capture; among them are the following:—

Essex.—I observed several, some of which I caught, at the end of August and early in September, in clover-fields in several localities in South-east Essex.—JOHN T. CARRINGTON.

Surrey.—I have to record the capture of *C. edusa* on Riddlesdown on the 6th of this month. I have been looking out for more, but have failed to see any up to this date. I thought perhaps we might be going to have a busy season with them by this one being so near London.—C. J. BODEN; 228, Bermondsey Street, London, S.E., September 23, 1889.

Isle of Wight (Ventnor).—While at Ventnor I had the pleasure of taking five males and one female of the above, August 13th, 14th and 19th; no doubt I should have taken more if the weather had not been so rough. W. E. BUTLER; Chatham Street, Reading, September 13, 1889.

Berkshire.—Since returning to Reading I have taken three males, and know of about fifteen being taken here. As I have not taken it here for some years, I thought it would be of interest to some of our brother entomologists.—W. E. BUTLER; Chatham Street, Reading, Sept. 13, 1889.

Gloucestershire.—On Tuesday, Sept. 10th, Mr. A. C. Renwick, of Churchdown, saw several specimens of the above insects, hovering over ragwort on the railway line and in the fields adjoining, about two miles from Gloucester; he succeeded in taking one male; he had previously taken another. On Thursday, the 12th, Mr. S. W. Lane, of Brunswick Square, Gloucester, took a fine female whilst out shooting; as he had not his net he was only able to secure one. There are several reported captures, but the above are the only ones which I am able to authenticate.—M. STANGER HIGGS; The Mill House, Upton St. Leonards, Gloucestershire.

Devonshire.—During the second week in September a few specimens turned up in South Devon.—(Rev.) J. E. TARBAT; Whitley, Reading.

South Wales.—At a meeting of the Penarth Entomological Society, held on Tuesday, Sept. 10th, among other specimens exhibited were between twenty and thirty *Colias edusa*, these having been caught in this district since the beginning of August. Altogether about fifty have been captured thus far. It may interest your readers to know that *C. edusa* appears to abound about here for the first time for ten or twelve years. *Vanessa cardui* has been very abundant also this year. *Plusia gamma* has not been nearly so plentiful as last year. Sugaring has been very little use, and, generally speaking, insects have not been plentiful.—G. A. BIRKENHEAD, Hon. Sec.; Downs View, Penarth, near Cardiff, September 13, 1889.

Durham.—On September 2nd I saw a specimen of *C. edusa* near Durham. I am told it is some years since any have been observed in this county.—H. J. CARPENTER; Observatory, Durham.

COLIAS HYALE NEAR READING.—Early in September I saw a specimen of *Colias hyale* near this town.—(Rev.) J. E. TARBAT; Whitley, Reading.

LIMENITIS SIBYLLA VAR.—Whilst capturing some specimens of *Limenitis sibylla* in the New Forest this summer, I caught a variety which had the white entirely absent and was uniform black-brown, the underside consequently had not white, but was of brown turning to bluish grey near the body.—W. W. WALL; Spring Bank, Shirley Warren, Shirley, Hants, July, 1889.

APATURA IRIS. — I took this year a specimen of *Apatura iris*, settling on a clod of earth. At the time there was no apparent reason for its choice of alighting place, but resting on the spot two days subsequently, a most offensive smell became evident, which, on inspection, proved to arise from the decomposing remains of a snake, partly hidden by grass, a few inches away from the clod. — JOHN T. WINKWORTH; 22, Wallwood Street, Burdett Road, E., August 9, 1889.

VANESSA ANTIOPA IN ESSEX. — I captured on September 4th, in a garden in Wallwood Road, Leytonstone, a fine specimen of *Vanessa antiopa*. — G. C. FRINDELL; 20, Wellesley Road, Leytonstone.

VANESSA ANTIOPA AT CROYDON. — On the 14th September a friend came over and said he had seen a black butterfly bordered with yellow. I took my net at once and found it was sitting on a conservatory. It was high up, but I made a hit at it and missed; my friend saw where it flew to and we secured it. There were two or three plum-trees about and some fallen fruit. — SYDNEY C. HOVENDEN; Oaklands, Haling Park Road, Croydon, September 17, 1889.

VANESSA ANTIOPA IN SUSSEX. — My brother captured a specimen of *V. antiopa* here last week. This is the second specimen we have taken, as I caught one in August last year, near the same spot. — F. A. MULLENS, Jun., Westfield Place, Battle, August 31, 1889.

EPINEPHELE HYPERANTHES VAR. ARETE. — While working the same ground (S. W. Berks) where last year I took five specimens of the var. *arete* of *Epinephele hyperanthes* (as recorded in the 'Entomologist'), I have this year captured three more of the same variety. In a subsequent issue (Entom. xxii. 20), Mr. T. D. A. Cockerell suggested that experiences of others might prove that the damp summer of 1888 had much to answer for in modifying the normal markings of our butterflies. While admitting the possibility of last year's developments perpetuating their peculiarities, yet, to my mind, my latest captures rather point to a strain of this variety existing. — JOHN T. WINKWORTH; 22, Wallwood Street, Burdett Road, E., August 9, 1889.

POLYOMMATUS PHLEAS VAR. SCHMIDTII. — Yesterday, on Dartford Heath, I captured a specimen of *Polyommatus phleas*, having the usual copper colour replaced by almost pure white. Unfortunately it is damaged, as I had nothing but my hat to effect its capture. — CLEMENT T. YOUNG; Tower Cottage, Dartford, Kent, August 26, 1889.

SPRING RHOPALOCERA ON THE RIVIERA. — Mr. Norris's article, "On the Spring Butterflies at Hyères (Entom. 182), should be useful to intending visitors to the Riviera. A list of a few additional species I have found in Cannes and the neighbourhood, which Mr. Norris does not appear to have met with at Hyères, may serve as a supplement to his notes. Down to *Pieris daphidice* our lists agree, the var. *bellidice* (?) I have once met with. *Euchloë belia* var. *ausonia*, is common in May. Aberrations of *Leucophasia sinapis* I have sought for in vain. *Thecla spini* and *T. w-album* (one specimen), I have caught in the neighbourhood of Cannes, in the first days of June. Several of the former were flying round an oak-tree on a hot moor at mid-day. *Thestor bullus* does not belong to the Cannes fauna.

Lycæna bœtica and *L. telicanus* are by no means common at Cannes. Both fly on warm sunny days about the beginning of December. In 1885 *L. telicanus* was to be seen hovering about in the woods, and for a few days there were a great many to be seen; they all disappeared, however, about a week after their first appearance. There is a second brood later in the year, I believe, but certainly not before July. *L. orion* (*battus*): one specimen taken on the 13th May, 1884. *L. icarinus*: occasionally met with in May. *L. corydon*: excessively common in Cannes; rather larger than the northern type, as is also *L. adonis*. Of the former I have captured one specimen of the rare aberration *semi-brunnea* (Mill), on the 19th May. *L. dorylas*: three males on the 1st of June, 1886, inland, in a torrent-bed in the same locality as *L. sebrus*. *L. minima* (one specimen) and *L. semi-argus*. *L. melanops*: common wherever *Dorycinum suffrutescens*, its food-plant, grows. *Nemeobius lucina* and *Libythea celtis* are both blanks on the Cannes list. My *Charaxes jasius* have generally emerged during the second week of June, so that the first half of May is unusually early, even for bred specimens. *Apatura ilia* ab. *clytie*, I have never seen at Cannes. *Vanessa egea* occurred more frequently this year than usually. It is very common at Mentone in March. I have found larvæ of *V. urtica* in abundance, both on nettle and hop. They did not reach the perfect state till late in the season. *Melanargia galatea* var. *procida*: local, and a little later than *syllius*. *Argynnis dia*: very common this year at Cannes. *Epinephele pasiphaë*, I have not met with. *Spilothyrus althææ* and *S. lavatæræ*: rare. *Syrichthus orbifer* I do not think we take, but on the other hand, *S. alveus* (var. *fritillum*), is abundant and *S. carthami* is occasionally met with. Three other skippers are also found, especially on roadsides; they are *Pamphila thaumas* and *P. lineola*, and a third which I take for *P. actæon*, though larger than the British type. All the other insects mentioned by Mr. Norris are common to both Cannes and Hyères. During the summer *Satyrus circe*, *hermione*, *briseis*, *statilinus* and *arethusæ*, and *Epinephele ida*, are common. The *apollo* and many species of *Erebia* and *Polyommatus*, are common on the hills, as is also *Lycæna arion* and some others of the genus. A Russian species, *L. calestina*, was re-discovered some years ago at St. Martin Lantosque, where also the scarce *Papilio alexanor* is found. *Argynnis pales* is also found near Cannes.—J. C. WARBURG; 8, Porchester Terrace, W.

SPHINX CONVULVULI.—The following notices of the capture this season of *Sphinx convolvuli* have been received:—

Middlesex.—I observed recently in the Regent's Park Gardens, a large hawk-moth,—I think *S. convolvuli*, without doubt,—hovering over plants of scented white tobacco.—W. H. TUCK; 47, Cathcart Road, South Kensington, September, 1889.

Berkshire.—A very fresh specimen of this insect was brought to me on August 31st, which had been found resting on a garden railing in Reading. Two years ago the moth appeared somewhat plentifully in the neighbourhood.—(Rev.) J. E. TARBAT; Whitley, Reading.

Hants.—I have in my possession a large female specimen of this insect, which was found at rest by day on Sept. 10th; it is in fine condition and seems of a darker colour than usual.—J. M. ADYE; Somerford Grange, Christchurch, September 17.

Oxfordshire.—On August 26th last, at 8 p.m., I took, hovering over scented tobacco plants, a specimen of *S. convolvuli*.—H. T. BLISS; Chipping Norton, Oxon.

Glamorganshire.—It was my fortune to capture a good specimen of *Sphinx convolvuli* on the night of September 11th, about half-past eleven, hovering over the flowers of a balsam I have growing in my garden. I hear my friend Mr. Allen, of Porthkerry, about seven miles from here, caught two *S. convolvuli* about a fortnight since, hovering near some sweet-scented tobacco plants.—G. A. BIRKENHEAD; Downs View, Penarth, near Cardiff.

Lancashire.—On August 24th I had a large *Sphinx convolvuli* brought to me by a friend. It was caught by his gardener, settled on the wall of one of his greenhouses in his garden at Didsbury, near Manchester. The same night another was seen, and again on the 25th, both times flying over the flowers of the white tobacco plant. On the 26th I went with the hope of catching it and succeeded.—T. G. MASON; 8, Landsdowne Road, Higher Crumpsall, Manchester, September 16.

Aberdeenshire.—A fine specimen of *Sphinx convolvuli* was taken here on August 27th, 1889. There are always one or two taken here every year.—L. G. ESSON; 46, North Charlotte Street, Aberdeen, N.B.

SPHINGIDÆ IN KENT.—On August 22nd I captured a fine female specimen of *Sphinx convolvuli*, hovering over the flowers of *Nicotiana affinis* (tobacco-plant). I took a second specimen at the same place on the 31st, a male, in fairly good condition. I might also mention that I was fortunate in finding a larva of *Chærocampa porcellus* and also one of *Acherontia atropos* in this neighbourhood; both of them have retired underground to effect their transformation.—THOMAS WILLSON; Dudley House, Ramsgate, September 4, 1889.

ARCTIA CAIA.—I have bred over 700 imagines of *A. caia* without obtaining a single striking variety. One had hindwings nearly all yellow, and several had all the black spots banded into bars. These larvæ were fed on white parts only of lettuce and cabbage.—W. H. TUNLEY; 41, Chichester Road, Landport, September 16, 1889.

MALFORMED LIPARIS DISPAR.—I have bred a good many males of *Liparis dispar* with a rounded piece taken out of one or both hind wings; is this common?—W. H. TUNLEY; 41, Chichester Road, Landport, September 17, 1889.

[In Entom. vol. xi., p. 170, is a reference to this peculiar malformation which is figured in the coloured plate, to which the reference belongs. It is there stated that "Mr. Enock bred in 1887 upwards of eight hundred males and females of this species, and nearly all had the underwings notched as seen in the illustration." In his papers upon "Variation of Insects," Mr. Cockerell (Entom. 149) remarks upon this form.—J. T. C.]

STAUROPOUS FAGI IN WILTS.—Mr. Searancke's note in the last number of 'The Entomologist' (Entom. 212) has reminded me of another locality for *S. fagi*, which I believe is very little known to entomologists, viz., Groveley Wood, near Salisbury. I took three *S. fagi* there in 1887, on the 2nd, 4th, and 13th of July, and a friend of mine took another. I had very little opportunity of working the wood, but I believe if thoroughly worked it would yield some good species.—LEONARD S. SELLOS; DAVOS-Platz, Switzerland.

DICRANURA VINULA.—Whilst searching for larvæ on some willow trees in this district, on the 20th of July, I found four nearly full-grown larvæ and, at the same time, several ova of *Dicranura vinula* on the same tree. The four larvæ pupated during the first week of August, but the larvæ reared from the eggs are still feeding and have not yet moulted for the last time. I see that Stainton gives July and August as the times of appearance of the larva of this species, but the larvæ which I found on the 20th July must have hatched about the 1st or 2nd week in June. I may add that I found a larva on poplar on the 19th June, which had moulted for the second time. I also found (in 1888) several *vinula* larvæ, still quite young, as late as the 19th of September.—H. D. SYKES; The Cedars, Brigadier Hill, Enfield, August 26, 1889.

ACRONYCTA LEPORINA IN PERTHSHIRE.—I have to record the capture of several fine larvæ (some nearly full-fed) of *Acronycta leporina*, taken near Tummell Bridge, Perthshire, last month. I had believed *leporina* to have been a southern insect.—MRS. CROSS; The Vicarage, Appleby, Doncaster, September 11, 1889.

ACRONYCTA ALNI (LARVA) IN GLOUCESTERSHIRE.—Whilst out shooting on August 7th I captured a very fine larva of this rare species. It was crawling on my neck, so I am unable to say what its food-plant could have been. There were only fruit trees in the field where I found it. There is no mistaking its identity, as the habits and appearance of the larva are so characteristic. Its length is 33 mm. at rest, and the spines on the second segment are 5 mm. long. I can find no record of larvæ of *A. alni* having been taken in Gloucestershire before.—M. STANGER HIGGS; The Mill House, Upton St. Leonards, Gloucestershire.

STILBIA ANOMALA IN LANCASHIRE.—While mothing here one afternoon in August, I disturbed a nice female *S. anomala*, which is the first I have taken or seen here.—H. MURRAY; Lowbank Villa, Carnforth, September 14, 1889.

TRIPHENA ORBONA IN HANTS. — I have the pleasure to record the capture of a good specimen of *Triphæna orbona* (*subsequa*) near Lyndhurst, Hants, on the 1st of August last. My brother and I were walking amongst some heather about a mile from Lyndhurst, on the south side of the road from that town to the Lyndhurst Road Railway Station, when the insect flew by and was captured by my brother. I am sorry to say, however, that the moth is no longer in my possession. I had taken it last Saturday week to the Natural History Museum, South Kensington, to compare with specimens there, in order to make sure of the species, and was careless enough, in returning from the Museum, to leave the box containing it (with other species) on the rack in the railway-carriage. I have made every enquiry through the railway authorities and at Scotland Yard, but up to to-day have heard nothing of the box.—HENRY A. HILL; 132, Haverstock Hill, London, N.W., September 25, 1889.

CATOCALA FRAXINI IN HANTS.—I captured at Porchester, by sugaring, on September 3rd, a specimen of *C. fraxini*, and also another on the following night. They are both in good condition.—M. J. STARES; Porchester, Fareham, Hants, September 9, 1889.

CATOCALA SPONSA AND C. FRAXINI AT WINCHELSEA. — I caught the above on the nights of Aug. 20th and 22nd respectively, at sugar, the former during, and the latter immediately after, a strong W.S.W. wind. I believe they are both new to the local list.—D. W. CARR; Holbrooke, Derby, September 3, 1889.

CIDARIA RETICULATA, LONG IN PUPA. — I have proved to my satisfaction that *C. reticulata* stays more than one season in the pupa state. I have bred it this year from rubbish I collected two years ago. I have always suspected this. I have also bred *Eupithecia venosata* this year from larvæ I took in the Isle of Man in June, 1887.—H. MURRAY; Lowbank Villa, Carnforth, September 14, 1889.

NOTES FROM THE NEW FOREST. — I went down to Lyndhurst on August 2nd last, but bad weather setting in, I returned immediately. On the 15th I started once more and put up at Lyndhurst Road. During the fortnight that I stayed in the Forest there was a good deal of rain off and on, but the weather improved considerably towards the latter part of my stay. It was evidently a bad season there for Lepidoptera, for very few were to be seen on the wing, and I collected in nearly every part of the Forest. Of the Diurni, *Pararge egeria* was very abundant in some of the woods, and *Gonepteryx rhamni* was also plentiful and in fine condition. Instead of the countless numbers of *Argynnis paphia* that I noticed in Boldre Wood last year, this time only a few tattered individuals were to be seen now and again. I took *Satyrus semele* in a number of different localities, and the specimens were very good. The only other butterflies that I saw were *Pieris brassicæ*, *P. rapæ*, *P. napi*, *Vanessa urticæ*, *V. io*, *P. megæra*, *Epinephele ianira*, and *E. tithonus*. Sugar was a complete failure, for after going out night after night and trying a great many different spots, my total "bag" only amounted to one *Thyatira batis*, one *Xylophasia monoglypha* (*polyodon*), one *Agrotis suffusa*, three *Amphipyra pyramidea* and two *Mania maura*, although on one occasion my brother, myself, and a friend got almost "bagged" ourselves by a troop of about eight or nine forest ponies, which, with piercing neighs, came full gallop at our light, and had it not been for the friendly protection afforded by the trunk of a large oak, behind which we jumped, after shutting off the lantern, I expect that it might have been our last "sugaring" expedition. I was not altogether surprised at this scarcity of insects, after the very rainy cold weather of July and the severe gales at the commencement of August. I met with two different collectors at Lyndhurst, and on questioning them I found that their experience agreed entirely with mine as to the bad season.—W. H. BLABER; Groombridge, Sussex, September 16, 1889.

FOREST OF DEAN.—The Forest of Dean, for various reasons, does not seem to be a favourite hunting-ground for collectors. The ground is hilly and uneven, and hard to work. The trees are mostly of young growth, and too close together, and are nearly all oak. The soil is poor, and vegetation is, for the most part, limited to a coarse kind of grass with a sprinkling of bracken. There are, however, many places, especially near the edge of the Forest, where the trees are of large growth, and there are many beech, firs, holly and ash, with a few sycamore and birch mingled with the oak. Some of the clearings also are covered with furze, heath,

wild thyme, brambles, and other flowers. These spots may easily be missed by anyone not familiar with the ground, but when worked steadily and persistently may be made to yield many good things. For the larva-hunter there is no lack of sport. Nearly every year, towards the end of May, whole districts, sometimes the entire Forest, instead of being clothed with bright green leaves, have a scorched brown appearance, nearly every leaf being devoured, some trees being even killed outright by the depredations of the innumerable larvæ. Few, however, of these myriads survive. Flocks of young starlings, rooks and jackdaws adjourn to the Forest from all the country round, and fatten on their tender bodies, searching both ground and trees, so that after these birds are gone scarcely a larva is to be found. Cuckoos also abound, and "horse-ants," as they are locally called, come in for their share, climbing the trees to look for their victims. Sometimes, however, the aggressor gets the worst of it, the larva, if caught by the tail-end, being enabled to turn and eject its protective fluid over the ant's head, causing it instantly to let go, and ultimately to die. The following are from a list of over 300 species taken in the Forest. This list, I have no doubt, is capable of being largely added to:—*Argynnus paphia*, in one small enclosure only, where the dog-violet grows. *A. adippe*, rare. *A. selene*, frequent. *Vanessa c-album*, common. *V. poly-chloros*, frequent. *V. cardui*, frequent. *Apatura iris*, rare. *Thecla w-album*, very local, but abundant where it occurs. *Colias edusa*, one specimen only. *Smerinthus tilia*, frequent. *Chærocampa porcellus*, rare. *Psilura monacha*, rare. *Pericallia syringaria*, rare. *Nyssia hispidaria*, frequent. *Amphidasys strataria*, common. *Emmelesia affinata* and *E. alchemillata*, both common. *Lobophora halterata*, frequent. *Bupalus piniaria*, frequent. *Melanthia hastata*, rare. *Stauropus fagi*, rare. *Notodonta trepidata*, frequent. *Asphalia ridens*, frequent. *Acronycta leporina*, rare. *Triphæna fimbria*, rare. *Taniocampa munda*, very common, in pupa-digging more than fifty per cent. were the pupæ of this moth. *Apecta prasina*, frequent. *Amphipyra pyramidea*, common. *Phytometra viridaria*, frequent. *Hemerophila abruptaria*, rare. — N. T. SEARANCEKE; Mitcheldean, near Gloucester, August 23, 1889.

SUGAR UNPRODUCTIVE.—I can corroborate Mr. Hodges' note (Entom. 212) about the unproductiveness of sugar in June last. Both my brother and I "sugared" nightly for the first three weeks in that month, with most deplorable results; together we certainly did not take more than a dozen specimens. I do not agree with Mr. Hodges' hypothesis "owing to the cold." I think the better explanation is that it is owing to the superabundance of honeydew on the foliage, and I have come to the conclusion that very little good can be done until there has been sufficient rain to wash it off, as was the case last June.—C. E. STOTT; Lostock, Bolton-le-Moors, August 19, 1889.

PARASITES ON LEPIDOPTERA.—My experience shows these parasites (Entom. 237) to have been common during the season. On the evening of July 23rd, for example, I took a *Caradrina quadripunctata (cubicularis)* off a Chester gas-lamp. At first I took the moth to be a variety, as the upper wings,—upper wings only,—were mottled with red. This I discovered to be due to red parasites, similar in appearance to the ordinary cheese-mite. The insect, with parasites, is now in the Entomological Collection for the District, Grosvenor Museum, Chester. — J. ARKLE; 2, George Street, Chester.

PARASITES ON MOTH.—On June 26th I netted a specimen of *Noctua augur*, with the fore-wings almost covered with red parasites, giving the moth a very curious appearance. — W. E. BUTLER; Chatham Street, Reading, September 13, 1889.

BOMBUS TERRESTRIS IN LONDON.—I have observed this autumn a number of *Bombus terrestris*, revelling in the sunflowers in the Embankment Gardens, near Charing Cross. Where could they have come from? Do they breed in the gardens?—W. H. TUCK; 47, Cathcart Road, South Kensington, September, 1889.

ERRATUM.—On p. 234, 31st line in *Zeuzera pyrina*, read "sight" for "light."

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON.—September 4th 1889. — Capt. H. J. Elwes, F.L.S., Vice-President, in the chair. Prof. C. H. Fernald, of Amherst, Mass., U.S.A., and Mr. C. J. Fryer, of Emscote Road, Warwick, were elected Fellows; and Prof. C. V. Riley, of Washington, U.S.A., and Dr. A. S. Packard, of Providence, Rhode Island, U.S.A., were admitted into the Society. Mr. George T. Baker exhibited two remarkably dark specimens of *Acronycta ligustri* taken near Llangollen. Mr. P. B. Mason exhibited and remarked on a collection of Lepidoptera which he had recently made in Iceland. The following species, amongst others, were represented, viz.:—*Crymodes exulis*, *Tryphana pronuba*, *Noctua conflua*, *Plusia gamma*, *Larentia cæsiata*, *Melanippe sociata*, *Coremia munitata*, *Phycis fusca*, and *Crambus pascuellus*. The Rev. Dr. Walker also exhibited a number of Lepidoptera, Diptera, and Hymenoptera, recently collected by himself in Iceland. The collection included the following, viz.:—*Crymodes exulis*, *Noctua conflua*, *Larentia cæsiata*, *Coremia munitata*, *Culex pipiens*, *Scatophaga stercoraria*, *Calliphora erythrocephala*, *Heliophilus grænländica*, *Bombus terrestris*, &c. Mr. W. White exhibited, on behalf of Mr. G. C. Griffiths, a specimen of *Nephronia hippia*, Fab., var. *gæa*, Feld., which he believed to be hermaphrodite. He also exhibited, for comparison, a female of the same species. A discussion on hermaphroditism ensued, in which Mr. Distant, Capt. Elwes, Mr. McLachlan, and Mr. Baker took part. Dr. Sharp exhibited specimens of *Cyathura luteus* and *fungicola* Auct., and stated that they are the sexes of one species, *C. luteus* being the male, *C. fungicola* the female. In working through the Central American *Cyathurini*, he had found that in some genera the males differed greatly from the females in size and sculpture; but this was not a constant character, for in some species, while certain males scarcely differed from the females in these respects, others were so different that they would scarcely be recognised as belonging to the same species. Mr. Edward A. Butler exhibited specimens of *Platymetopius undatus*, Deg., from Ewhurst, Surrey. He remarked that the species was recorded as having been once previously taken near Plymouth by the late Mr. John Scott. Mr. G. T. Baker read a paper entitled, "On the distribution of the Charlonia group of the genus *Anthocharis*." Mr. Baker stated that the species, six in number, of this small division of the genus *Anthocharis* formed a very natural and closely allied group, presenting many points of interest, both

in their relationship to each other and in their geographical distribution, which extended from the Canaries on the west to the valley of the Indus on the east. The author's theories as to the causes of the present distribution of the group, which were based on geological data, were discussed by Capt. Elwes, Mr. McLachlan, Mr. Distant, and Mr. Stainton. The Chairman read a paper entitled, "On the genus *Argynnis*," which gave rise to a discussion in which Mr. Distant, Mr. Jenner Weir, and Prof. Riley took part.—H. Goss, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.
—August 22nd, 1889. J. T. Carrington, Vice-President, in the chair. Mr. Wellman exhibited a number of *Abraxas grossulariata*, showing considerable variation, and *Scoparia angustea*, from Folkestone. Mr. Skinner, a bleached example of *Epinephela ianira*, taken at Box Hill. Mr. Carrington, on behalf of Mr. Lewcock, some 300 specimens of Coleoptera taken during the season, being some of the larger aquatic species, a few Donaciæ, Malacoderma, Heteromera, &c., mainly from Chattenden, Epping, Woking, and Farnham.

September 12th, 1889.—T. R. Billups, President, in the chair. Mr. Jenner Weir exhibited desquamated upper wings of the male of *Argynnis paphia*, in order to show that the apparent thickening of the median nervules and sub-median nervure, in that sex of the species, was due to the dense covering of broad scales, bent over and concealing some very narrow, clavate, black scales or androconia; these appeared to be of a different substance to the ordinary scales of the wings, so that when, by the Waterhouse process, he had denuded the wings of the ordinary scales, the androconia remained intact, and were removed by the use of the camel's-hair brush, considerable friction being necessary. Mr. Weir remarked that he had been induced to bring this matter before the Society, because he found that some British entomologists appeared to think that, in the restricted genus *Argynnis*, there was a real dilatation of some of the median nervules, and occasionally of the sub-median nervure, but a reference to Mr. Scudder's work on the 'Butterflies of the Eastern United States and Canada,' and to the 'Exotische Schmetterlinge von Dr. Staudinger und Dr. Schatz,' would show that neither the American nor German entomologists named had fallen into such an error. Mr. Weir exhibited some specimens of *Vanessa urticae* bred from larvæ taken at Lewes; these, although bred from one locality, showed great variation in the amount of yellow on the fore wings: in one instance that colour formed almost a band across the wings, and in one of the specimens the costa was unusually dark, and the red of the lower wings very much reduced in extent. Mr. Wellman, *Bryophila muralis*, *Lobophora polycommata*, and dark forms of *Gnophos obscuraria*, from Folkestone. Mr. Croker, *G. obscuraria* from the New Forest, and a variety of *Taniocampa gothica*, closely approaching var. *gothacina*, taken at West Wickham. Mr. Fenn mentioned that he had taken a similar variety at Lewisham. Mr. Auld, a long series of *Cidaria truncata*, bred from a female captured in the New Forest. Mr. Turner, a pink variety of *Hypsipetes sordidata*, also dark forms of *Boarmia gemmaria* from Ashdown Forest, and specimens of *Cabera rotundaria*. A discussion ensued as to whether this was a distinct species or only a variety of *C. pusaria*.—H. W. BARKER, *Hon. Sec.*





Below me the
youngest
Hubbard

THE ENTOMOLOGIST.

Vol. XL.]

NOVEMBER, 1889.

[No. 915.]

FREDERICK BOND IN MEMORIAM.

FREDERICK BOND was born at Exmouth on the 22nd February, 1841, being the third son of William Bond, a Captain in His Majesty's 77th Foot, whose widow married a brother-officer of the same surname, Captain Benjamin Bond, of Mount Pleasant, Finsbury, Middlesex. He was educated at Brighton, and was intended for the medical profession; but the dissecting-room was repulsive to him, and being blessed with a competency sufficient for his modest requirements, he was left free to indulge his propensity for sport and natural history, and became an adept alike with gun, rod, and net. He was also devotedly fond of flowers and ferns, and, particularly in his later years, would spend hours in attending to his garden and greenhouse. But his chief occupations were shooting, fishing, and collecting insects; and being endowed with great power of observation, he amassed a vast store of knowledge respecting the habits of our native birds and insects, principally of Lepidoptera. Primarily he was an ornithologist, and his collection of British birds and their eggs was remarkable. But his ornithological virtues will doubtless be recorded elsewhere. It is of the entomologist that we have here to speak, and in his character of British Lepidopterist to take a last farewell of our departed friend.

At the age of fifteen, or thereabouts, Frederick Bond began to collect insects, and down to the time of his death he seized an opportunity of adding to his cabinet. He cared little or nothing for foreign insects, and his British collection was confined to the Order Lepidoptera. It is not too much to say that it is one of the best collections of the present day. It is superbly splendid, and especially rich in curious varieties; whilst its value is enhanced by the fact that so large a proportion of the whole were captured or bred by himself.

BYRON.—NOV. 1889.

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Bellevue on the
Grounds of the
Hospital

THE ENTOMOLOGIST.

Vol. XXII.]

NOVEMBER, 1889.

[No. 318.]

FREDERICK BOND: IN MEMORIAM.

FREDERICK BOND was born at Exmouth on the 22nd February, 1811, being the third son of William Bond, a Captain in His Majesty's 77th Foot, whose widow married a brother-officer of the same surname, Captain Benjamin Bond, of Mount Pleasant, Kingsbury, Middlesex. He was educated at Brighton, and was intended for the medical profession; but the dissecting-room was distasteful to him, and being blessed with a competency sufficient for his modest requirements, he was left free to indulge his propensity for sport and natural history, and became an adept alike with gun, rod, and net. He was also devotedly fond of flowers and ferns, and, particularly in his later years, would spend hours in attending to his garden and greenhouse. But his chief occupations were shooting, fishing, and collecting insects; and being endowed with great power of observation, he amassed a vast store of knowledge respecting the habits of our native birds and insects, principally of Lepidoptera. Primarily he was an ornithologist, and his collection of British birds and their eggs was remarkable. But his ornithological virtues will doubtless be chronicled elsewhere. It is of the entomologist that we have here to speak, and in his character of British Lepidopterist to take a last farewell of our departed friend.

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With the exception of two or three years' residence in Cambridge, about five and twenty years ago, Mr. Bond lived all his life in or near London,—at Kingsbury until 1855, afterwards in Cavendish Road, St. John's Wood, and Adelaide Road, Haverstock Hill; whilst the last sixteen or seventeen years of his life were spent at Staines. He was elected a member of the Entomological Society in 1841, and joined the Zoological Society in 1854. At the meetings of the former he was for many years a regular attendant and exhibitor, though latterly, owing to his retirement to Staines and his increasing deafness, the Society has missed his genial presence.

I am not aware that he ever travelled beyond the seas; but his shooting and collecting excursions were frequent, and extended to all parts of the Island. During his long career he captured so many rarities that it is impossible to enumerate the species. Conspicuous among them was the lost *Noctua subrosea*; and in his early days he both captured and bred the extinct *Lycæna dispar*. He used to tell how a Mr. Henderson transported larvæ of *L. dispar* from their native haunt in the fens to some water-docks which grew in a small pond in his garden at Milton, near Peterborough; and I believe it was at this spot that Mr. Bond last saw *L. dispar* on the wing.

It was one of his sayings that a naturalist ought to have three lives: seventy years to collect, seventy to study his collection, and seventy to impart his knowledge to others. For the last dozen years he gave his services as assistant editor (for Lepidoptera) of this magazine, and none will be more ready than the editor and his colleagues to acknowledge the value of the aid he rendered. But our friend had no literary proclivities; he was no great student of books, and he seldom took up his pen when he could avoid it. His published articles consist only of a few short notes, scattered over the various Natural History journals of the last sixty years; the earliest appearing in 'Loudon's Magazine' in 1830, and the last in 'The Zoologist' for June, 1889. The following list includes all his notes on entomological subjects that I have been able to discover:—

1. Note on the occurrence of rare British Insects. Zool. 1843, p. 125.
2. Note on the cure of "grease" in insects. Zool. 1843, p. 175.
3. Note on the occurrence of *Colias edusa* and *C. hyale* in Northamptonshire. Zool. 1844, p. 397.
4. Note on the capture of *Polyommatus arion*. Zool. 1845, p. 803.
5. Flowers attractive to Moths. Zool. 1846, p. 1341.
6. Occurrence of *Sphinx convolvuli* near Kingsbury, Middlesex. Zool. 1846, p. 1510.
7. Occurrence of the Locust at Kingsbury, Middlesex. Zool. 1846, p. 1518.
8. Occurrence of the Locust at Duxford and Fulbourne. Zool. 1846, p. 1521.

9. Capture of *Vanessa antiopa* near Kingsbury, Middlesex. Zool. 1847, p. 1791.
10. Capture of Lepidoptera near Yaxley in Huntingdonshire, from the 12th to the 20th of August. Zool. 1847, p. 1881.
11. Occurrence of the Locust near York. Zool. 1847, p. 1900.
12. Capture of *Buprestis mauritanica* in Plaistow Marshes. Zool. 1848, p. 1999.
13. Occurrence of the Locust in Cambridgeshire. Zool. 1848, p. 2000.
14. *Colias edusa* and *C. hyale*. Zool. 1849, p. 2612.
15. Captures of Lepidoptera at Hornsey, Wicken, and Burwell fens between June the 8th and July 1st, 1850. Zool. 1851, p. 3012.
16. Occurrence of *Vanessa antiopa* near London. Zool. 1852, p. 3715.
17. Occurrence of *Deilephila lineata*. Zool. 1860, p. 7107.
18. Occurrence of *Sesia spheciformis* in Sussex. Zool. 1860, p. 7249.
19. *Acidalia rubricata* at Brandon in Suffolk. Entom. ii. 70 (1864).
20. Capture of *Acidalia rubricata*, &c. Ent. Mo. Mag. i. 96 (1864).
21. Capture of *Agrophila sulphuralis*, with notice of its habits. Ent. Mo. Mag. i. 214.
22. *Rhyssa persuasoria*. Ent. Mo. Mag. i. 278.
23. A new locality for *Gelechia pinguinella*. Ent. Mo. Mag. ii. 136 (1865).
24. A new locality for *Endromis versicolor*. Ent. Mo. Mag. iv. 12 (1867).
25. *Lasiocampa quercus* versus *callunæ*. Ent. Mo. Mag. iv. 35.
26. Occurrence of a *Fumea* (*F. crassiorella*, Bruand) new to Britain. Ent. Mo. Mag. iv. 113; Entom. iii. 368.
27. *Dianthæcia conspersa* as an Irish species. Entom. iv. 121 (1868).
28. *Deilephila galii* in Herefordshire. Entom. v. 168 (1870).
29. *Deilephila livornica* in Dorsetshire. Ent. Mo. Mag. vii. 40 (1870).
30. *Deilephila galii* in Herefordshire. Ent. Mo. Mag. vii. 86.
31. *Ephyra pendularia*, var. Entom. ix. 217 (1876).
32. Variety of *Saturnia carpini*. Entom. x. 1 (1877).
33. *Danais archippus* in Sussex. Entom. x. 73.
34. *Cidaria fulvata*, var. Entom. x. 120.
35. Note on *Polyommatus dispar*. Entom. xiii. 139 (1880).
36. *Zomaspilis marginaria*. Entom. xiii. 169.
37. Notes on the season. Entom. xiv. 184 (1881).

Add to this meagre list the fact that the entomological notes he has left (now in the possession of his godson, Mr. Thurnall), are scarcely in a form to be made available for public use; and we cannot but regret that so large a stock of entomological lore lies buried in the grave of Frederick Bond.

But though averse to writing, he delighted to recount his experiences, and the pleasure he took in giving information to others was a distinguishing trait in his character; to the close of his life, he was never too tired or too ill to show his treasures, to answer any number of questions, to name any quantity of species for a youngster, and generally to give the benefit of his practical knowledge to every one who sought his aid. On his favourite subjects he was brim-full of information; and I never knew a man with whom it was such a pleasure to have a chat about butterflies or moths. Take a few specimens to him,

"Now, Mr. Bond, what's that? where do you think it came from? and what does it feed upon?" Nothing more was required; he would pour out all he knew, take you to his cabinet and show you a perfect series or perhaps a finer variety of the same insect, then pass from species to species, tell you where and when he captured this or bred that, interspersing the whole with quaint anecdote and homely story,—his eyes twinkling, and his rugged features beaming all over with merriment,—until the visitor forgot the lapse of time and found himself late by an hour or two for his next appointment. Such at least was my own experience when I first went to see him at home. My earliest recollections of Mr. Bond go back for well-nigh forty years, to the time when the Entomological Society was located in Old Bond Street, and to the days when he was in the habit of visiting his old friend and connexion, Mr. F. Barlow, at Cambridge. But it must be about thirty years since I first saw his collections. In company with Alfred F. Sealy, I went to Cavendish Road; we were unexpected, but the Master was at home, and the result was that, between his cases of birds, his drawers of insects, and his fund of anecdote, a spring morning had turned to evening twilight before we had finished our gossip.

It was never my lot to have a day's collecting with Mr. Bond. But those who have worked with him in the field speak with one voice of the vigour and perseverance with which he pursued his object, and of his unflagging cheerfulness, even under the most depressing circumstances.

He was a collector,—of the old school, and of an insular type, if you will,—but a collector pure and simple, who was more at home in the field than in the library, who always kept his eyes open, and learnt from Nature herself many of her lessons that had escaped the observation of others. His liberality to his brother-collectors was unbounded; and the sound advice and encouragement he so freely gave, especially to beginners, has probably done more to advance the science of Entomology than if he had written a hundred books.

His simplicity of mind, his unselfishness, his constant cheerfulness, and his unvarying kindness, endeared Frederick Bond to all who knew him. Either as man or entomologist, where shall we find his like?

At the ripe age of seventy-eight, his peaceful and uneventful career has ended. He lived and died a bachelor, a widowed half-sister having ministered to his domestic comforts for the last thirty-eight years of his life. His death took place on the 10th August, 1889.

The accompanying photograph was taken in 1882, and fairly recalls his features. Already, however, a generation of entomologists has grown up, to whom he can scarcely have been

personally known. He has left no writings to perpetuate his name, and future ages will know him only through his eponyms, the British Noctuid, *Tapinostola Bondi*, and the Indian Longicorn, *Xynenon Bondi*. But by his surviving friends his memory will be cherished; and to those who knew him best, his long and happy life will be the sweetest retrospect.

J. W. DUNNING.

NOTE ON THE CLASSIFICATION OF CICADÆ.

By G. B. BUCKTON, F.R.S., &c.

As Entomological science progresses, the families of Rhynchota call for more attention in this country than has been hitherto bestowed upon them. Good workers, like Messrs. Douglas and Scott, in their 'Monograph on the Hemiptera-Heteroptera,' and Mr. James Edwards in his 'Synopsis of British Cicadinæ,' have published valuable matter relating to this order of insects. Still no illustrated work on the last-named sub-family exists, though the group offers considerable interest both in the varied forms and colours of the species, their life-histories, and, from a literary point of view, in the curious mythic notions connected with some species; which have been spun from the imaginations of not a few ancient classic poets.

To assist in the identification of the British species, generally recognized by the name of Cicadæ or Cicadidæ, I have a monograph in preparation, which will appear towards the commencement of the next year, giving coloured representations of all the British species,—upwards of two hundred,—which have come under my notice.

Zoological classification must primarily depend on the comparison of species with species, which involves a kind of uncertainty as to what characters shall be used to form a system that lays claim to be in any sense a natural one. Thus, much will depend on the opinion of the systematist, and the acumen he shows in fixing on those characters which are really specific.

Probably many will hesitate to accept the words of Fabricius as to generic names, "Optima nomina quæ omnino nil significant." Yet it will be admitted, that in forming the main heads of classification, the use of highly distinctive names may sometimes occasion inconsistency.

Latreille divided the Cicadæ or Cigalles into "les Chanteuses" and "les Muettes," and quite lately, Mr. W. L. Distant has divided the Indian Cicadidæ he describes into two groups, which practically separates the singing from the silent genera. The insects comprised in the latter division must be numerous in

the temperate regions of the Himalayas; but to them he does not appear yet to have given a name.

The author of the present note invites a suggestion from students of the Hemiptera, for some suitable name to be given to the large number of Trimerous insects which do not stridulate, and which are neither Aphides nor Coccidæ, nor members of any of the families usually comprehended in the Hemiptera-Homoptera. Burmeister, Fieber, Sahlberg, Walker and Edwards, have all shown a connection between the extremes of Cicadetta and Typhlocyba, for these writers group the genera under the head Cicadina. An equivalent of "les Muettes" of Latreille, which will range with the Stridulantia of Burmeister, is wanted. Tentatively the term "Silentia" is offered, and for the whole family the term "Tettigiidæ," which will range with Aphididæ and Coccidæ.

Such a scheme would perhaps meet the views of those who consider that the possession of sounding organs with opercular scales in the males alone, is of sufficient import to sharply divide our only known British species from the Cercopidæ and Jassidæ, which have them not.

The annexed sketch, which is partially filled in, will show the position taken by the Cicadæ amongst other Rhynchota.

The word Cicadæ is here used as a plural to the English word Cicada.

Sketch-plan for the British Cicadæ.

	FAMILY	SUBFAM.	TRIBE	SUBTRIBE	GENUS
RHYNCHOTA HOMOPTERA.	Tettigiidæ	Stridulantia	Tibicinæ		Cicadetta
			Cicadinæ		Centrotus
		Silentia	Membracinæ	Centrotidæ	Gargara
			Fulgorinæ	" "	Issus
				Delphacidæ	Tettigometra
			Cercopinæ		Asiraca
					Liburnia
					Triecphora
					Aphrophora
				Ulopidæ	Ulopa
	Aphididæ			Ledridæ	Ledra
				Bythoscopidæ	Pediopsis
				Acocephalidæ	Idiocerus
					Athysanus
				Typhlocybidæ	Deltocephalus
					Eupteryx
					Zygina
			Jassinæ		
	Coccidæ &c.		Aphidinae		
			Lachninae		
			Chermesinae		

Weycombe, Haslemere.

LUPERINA TESTACEA VAR. NICKERLII, FREYER.

By RICHARD SOUTH, F.E.S.

MR. BAXTER, of St. Anne's-on-the-Sea, Lancashire, has most kindly sent me a *Luperina* which he thought might be referable to *L. testacea* var. *gueneei*, Doubl. It was taken close to the water's edge on the 1st of August, and no example of typical *testacea* was seen by Mr. Baxter until the 10th of that month. In some respects the specimen agrees with Doubleday's description of *gueneei*, but it appears to be a form of *testacea* intermediate between *gueneei* and *nickerlii*.

The variety *nickerlii*, previously only recorded with certainty from Bohemia, though also reported to occur in the South of France, is usually regarded as a distinct species. Dr. Staudinger, however, considers it as probably a Darwinian species, and as it certainly is now linked up with *gueneei* by this Lancashire specimen, the logical conclusion would appear to be that if *gueneei* is a variety of *testacea*, *nickerlii* cannot be a distinct species.

By the courtesy of Mr. Leech, I have had an opportunity of examining three specimens of *nickerlii* from Bohemia, and the following description is taken from the most distinctly marked example:—

Forewing grey, tinged with ochreous, apex paler; orbicular and reniform stigmata broadly outlined in white; central area traversed by two whitish lines, the first is wavy with a sharp inward projection before reaching the inner margin, and bordered externally with black; the second edged inwardly with black commences as a white spot on the costa, unites with a larger white spot on the subcostal nerve, and then curves gently round the reniform, beneath which its course is inclined inwards to a black longitudinal bar connecting it with first line, from whence it proceeds vertically to the inner margin, emitting a short outward projection on the submedian nervure; between the base and first line is a short black bar just above inner margin; the submarginal line is pale, indented, and edged internally with dusky; two white spots on costa between second central and submarginal lines and one towards base; a series of small black lunules on outer margin. Fringes grey, spotted with paler at the extremities of the nervules. Secondaries silky white, with the faintest possible trace of a dark line before the fringes. Expanse 1 inch 4 lines.

In one of the other specimens referred to, the submarginal line is indicated by the dark internal shading only, whilst in the third the longitudinal bar is not present, and the submarginal line is followed by a darker band, as is often seen in *testacea*.

The ground colour of the Lancashire specimen is pale grey; the whitish transverse lines do not show clearly, but the black edging is very distinct, as also are the white spots on costa. The central lines approximate above the inner margin, but the longitudinal connecting bar is only faintly outlined; and there is a black dash between the lines on the inner margin. Fringes pure white. I may add that another specimen, received from Mr. Baxter, is in most respects of the ordinary *testacea* form, but has the central line connected by a black bar along inner margin, and there is no trace of the usual longitudinal discal bar.

15th October, 1889.

INVESTIGATION OF VARIATION.

By J. W. TUTT, F.E.S.

MR. CARRINGTON has hit at the root of the difficulty of forming a "Variation Investigation Society" in the one word,—*"funds."* Given sufficient *"funds,"* anything might be done.

I think that almost all entomologists are agreed on the value of the study of Variation. It is the one purely scientific view of our subject that all entomologists can work at, with all due respect to those who would teach us that every entomologist ought to be the happy possessor of a chemical and a physiological laboratory, and that the biological view is the *"be-all"* and *"end-all"* of our subject. The rapid strides which individual work has brought about in our ideas of variation are beyond question, and there are very few lepidopterists (at least), who are not interested in this phase of the subject.

Mr. Carrington asks two pertinent questions, the first of which appears to depend on the second. Are there a sufficient number of students to support such an association? Of students in the strict sense I would answer,—No. Of those interested, and thus indirectly students, I would most decidedly answer,—Yes. But the latter must be subdivided into two distinct sections, *viz.*, those who know that when a scientific work has to be carried out, it costs something, and, secondly, those who do not appear to have grasped this principle. I would have put it differently, and suggested that the second class must know that there is a cost, but that they do not care to pay, although they do not mind being the recipients of that knowledge which others have dearly bought; but I think *"Evil is wrought from want of thought,"* and not from want of sympathy. Entomologists have never supported their literary men. Our best entomological works have nearly all been brought out at a positive loss. Until the general entomologist recognises the fact that he ought to *subscribe to a scientific work which is really wanted, nothing*

worthy of the name of pure science can be done. Assuming what Mr. Carrington knows regarding the matter, I am not surprised at his doubts. The failure to get sufficient subscribers for a 'General Index to the Entomologist,' which is most urgently needed, is a proof that the individual does not see that he ought to help, indirectly, those who make use of a work of this kind and give the public the benefit of their work. If all who were *indirectly* interested in this subject had subscribed, every reader of our entomological journals would have sent in his name, instead of finding an excuse not to do so.

To return to the subject. I have not the remotest doubt that if all those who are interested in "Variation" would *subscribe*, and subscribe regularly, something might be done; but at present I am inclined to doubt whether many of the much-interested parties would "pay for their whistle." I would propose that if anyone would subscribe towards such an association, they should send in their names to Mr. Carrington. It is of no use for a few to do so,—everyone should do so, and a comparatively small subscription would produce a large result from a large number of members. Would 500 readers of the 'Entomologist' subscribe 2s. 6d. per year, or 250 subscribe 5s.? If so, a Council might at once be formed and the work taken in hand, and I have but very little doubt a satisfactory volume on the subject might be annually sent to subscribers, for their money.

ENTOMOLOGY OF ICELAND: NOTES UPON A VISIT IN 1889.

BY THE REV. F. A. WALKER, D.D., F.L.S., &c.

(Continued from p. 249.)

SIGLUFJORDUR, August 3rd (lat. 66° 9' N., long. 18° 83' W.). Siglufjordur, like Saudakrok, is situate on the beach, but is a far smaller place, apparently only consisting of from fifteen to twenty houses, and with far steeper hills in the background. There are a few cottages also at the opposite side of this branch of the fjord, and at the end of the said branch, at no great distance, the surrounding hills are permeated by watercourses descending from the ridges of snow near their summits and likewise fissured by ravines. It is more northerly than any place that we stopped at in the whole course of our voyage, and is said to be the most snowy bay in the country. Steam-whistle sounded as a signal that the people may now bring their merchandise on board. I took the opportunity of going ashore during the comparatively short time the steamer stopped here. Noticed one or two *Crambi*, caught one *Phrygania* and three *Calliphora*. These Diptera, along with *Sarcophaga mortuorum* were settled on a mass of

whale-blubber on the greensward. Two paths over the hills here lead respectively to Akureyri by different routes, in circuitous crooks and turns, the course of one of the said two paths going as far round as Skagafjord.

Akureyri (lat. $65^{\circ} 40'$ N., long. $18^{\circ} 4'$ W.). August 3rd. Akureyri, termed Ofjord in Danish, is situate more than thirty miles from the entrance of the spacious Eyjafjordur, far to the south, and nearly at its innermost extremity, and beyond these thirty miles of sea thirty miles of valley succeed, and then fifteen miles of desert. We enter the fjord about 1 p.m. Its western cliffs, near to which we are coasting, are for a while barren, indented by perpendicular fissures, and descending sheer into the sea, and down lower receding behind a dip of the land or a sloping valley of greensward, which is permeated by a water-course that trickles down. Akureyri, as seen from the water, appears to consist of two distinct hamlets; it is, however, possible that further inland other houses, unseen from the steamer, may form a connecting link. A terrible odour reaches us as we stand on deck, from the shark-oil factory, notwithstanding that it is situate a considerable distance from where our steamer is anchored. More vegetables, and potatoes in particular, as far as I can judge, are grown on the adjacent slopes here than in any other place that I have yet visited in Iceland. Pouring rain set in before we left the steamer and continued all the time we were on shore and lasted through the evening, while a dense mist enveloped the surrounding hills from our view, so that the only capture I effected was that of one *Phrygania*, and Mr. Jomhurs-son's little boy gave me a *Noctua* when I called at his house.

August 4th. There was more rain early this morning. By the time I went on shore, however, it had almost stopped, and I walked up to the top of the moor, accompanied by three of Mr. Jomhurs-son's children. *Creophilus maxillosus*, Carabidæ, and other Coleoptera, under stones; three or four Geometridæ seen. *Calliphora* abundant on the windows of the church, which is a very neat edifice, with galleries on either side and at the west end, and a picture of the Crucifixion over the communion-table. Large numbers of *Calliphora* also lying dead on the window-sills and the floor. The cemetery or churchyard is situate at the top of the moor, which is covered with the seed-vessels of *Dryas octopetala*. *Viola tricolor*, a flower I had not seen before in Iceland, is abundant on the slopes here, and also along the coast-road to Oddeyri, distant perhaps one English mile, and where the shark-oil factory is situate, a short distance from the other part of the parish of Akureyri, whence I took boat for the steamer, which had moved in the interval for a short space to that end of the bay. The above-mentioned coast-road is closely hemmed in between the waves on one side and a grassy slope on the other, and almost covered in one or two places by the water.

Vopnafjord (lat. $65^{\circ} 42' N.$, long. $14^{\circ} 50' W.$). August 6th. We passed Langanes, the N.E. point of Iceland, shortly before breakfast this morning. The east coast here consists of a low rocky cliff, almost as uniform as a wall for a considerable distance in point of elevation, and trends rapidly to the southward after passing the aforesaid headland, so that we are now steaming along at a distance from the shore. The adjacent hills in the rear are grassy slopes, far lower on the northern than on the southern side, where the heights are terminated by rocky crags, on which cloud-wreaths are resting, and some patches of snow still remain.

Seydisfjord (lat. $68^{\circ} 17' N.$, long. $13^{\circ} 58' W.$). August 7th. Seydisfjord is a marvel of natural beauty. I went ashore shortly after 6 a.m. An amphitheatre of hills (and this is a highly appropriate term, for there are successive rocky terraces between the grassy slopes), surrounds the calm blue waters of the fjord, which closely resembles a placid azure lake in the bosom of the mountains. On the adjacent sunlit slopes both cattle and ponies are grazing. The whole place reminds me of what I have experienced in Switzerland, plus the disagreeable adjunct to every Icelandic fjord,—the bones and insides of fish steam everywhere,—not that this is so great and noticeable a disfigurement here as in several of the fjords that we have previously visited. Several slender waterfalls leap down the ravine, as though their threads of silver were all eager to reach the sunny verdant grass and glancing water below, and to escape from their native cradles, the long extinct craters on the summit of the hills, with their sides lined with patches and beds of snow. These colossal basins of ebony, with rims of white which the sun only touches sufficiently to make their gloom and desolation evident, seem to frown on the fair pastoral scene beneath, and to say, "Make the most of your three months' summer, before the mountains are once more concealed beneath a snowy mantle, and the fjord enclosed and shut up with chains of ice beneath the winter's gloom." *Calliphora* settled on two heads of catfish rotting in the sun; *Sarcophaga mortuorum* and Carabi, three Phryganas, one Geometra, two *Calliphora* caught; Crambi also noticed. Flowers: *Eriophorus campanula*, *Parnassia palustris*, two species of gentian.

Eskefjord (lat. $65^{\circ} 5' N.$, long. $14^{\circ} 1' W.$). August 7th. The coast scenery near the mouth of Seydisfjord, and also when we reach the open sea once more, crag and cliff and watercourse and crater, with deep indentations and winding valleys, continue very bold and fine. I obtained here *Sarcophaga mortuorum* and *Calliphora*, two of Geometra, two of Coleoptera, *Bombus terrestris*, white variety of gentian, yellow-flowering *Andromeda*, on the neighbouring slopes close by the waterfall.


(To be concluded.)

CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES
OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.

BY J. W. TUTT, F.E.S.

(Continued from p. 255.)

Apamea, Och., *pabulatricula*, Brahm, (*connexa*, Bork.).


THE type of this species is described by Brahm, 'Insektenkalender für Sammler und Ökonomen,' as:—"Grey *Noctua*, with orange-coloured crests." "Head and palpi grey; antennæ ash-coloured; eyes black-brown; crest grey, and has in front a faint brown transverse line, on each side a black brown streak, in the middle an erect orange-coloured crest; body grey, with a few ash-coloured ridges (comb-shaped) on the back. Fore wings grey, with a short brownish black line at the base of the wing. The orbicular and reniform stand in a light brown ground; before and beyond the stigmata is an undulating transverse line, which come so near together that they almost join and form the apex of an almost right-angled triangle, but instead of really joining they separate suddenly and turn back arch-like; the space to the inner margin filled out with blackish brown, crossed by a pale grey longitudinal line, which also passes through both transverse lines; on the inner margin stand a few pale brownish tooth-shaped markings turned towards the inside, and close to the edge a row of blackish brown triangular spots. Hind wings ashy grey." This description agrees almost precisely with the specimens captured in Yorkshire, and sent out by Messrs. Harrison and Young in considerable numbers; but Mr. Young writes:—"In fresh specimens the crest is rosy. The hind wings, too, are dark smoke colour, nearly black, but both the rosy crest and dark hind wings soon fade" (*in litt.*). There appears to be no variation worth speaking of; occasionally the shading on the costa is stronger, and hence makes the central area (enclosing the orbicular) more band-like; the width of the black -mark varies, and thus causes a difference in the width of this central band in its lower part; the pale line (really on the nervure), mentioned above as crossing the lower part of the band, is often indistinct; and the row of black triangular spots (really the teeth of the wavy subterminal line) are very poorly developed in British specimens. Hübner figures this species under the name of *elota*, with the central band and base of wings ochreous. Our specimens possess the slightest possible ochreous tinge in the centre of the banded area, but I have never seen any real characteristic development in this direction.


Var. *elota*, Hb.—Hübner, as mentioned above, figures in his 'Schmetterlinge,' &c., a form of this species with the markings much as in the figure of Newman's 'British Moths,' but with the central and basal areas of the anterior wings ochreous, and the costal and outer margins white.

Apamea, Och., *unanimis*, Hb.

This is an almost constant dimorphic species, one of the forms resembling somewhat the reddish variety, *rufescens*, of *gemina*, the other having the same ground colour, but having the peculiar claviform \equiv -like development seen in the var. *intermedia* of *gemina*; but the smaller size of this species, the well-developed, white-outlined reniform, narrower wings, and other minor characters serve at once to distinguish it; the dark transverse shade from the costa to the inner margin, extending between the stigmata, and so noticeable in some other genera, is very distinct in some specimens. Why Newman wrote that this species was larger than *gemina* ('British Moths,' p. 305), I cannot understand, as his description would not lead one to suppose that he was in doubt about the species. I have one very dark specimen labelled "Shoeburyness," and two others from Cambridge, with the central area inclining to a banded character (as in *pabulatricula*). There is a certain amount of sexual variation, the females being, as a rule, somewhat smaller and darker than the males. Guenée says of this species, "It varies rarely, and is, in this respect, very different to its congeners" ('Noctuelles,' vol. v., p. 209). Hübner's figure 556 (which is a very poor one) represents the type, and is of a dull brownish colour, with typical transverse markings. The figure represents a small female. It has "the anterior wings dull brown, with an abbreviated, followed by a complete basal line; the orbicular small and faintly outlined; reniform outlined in white; a pale angulated line directly beyond reniform; another pale line parallel to hind margin; extreme hind margin slaty grey. Hind wings dark grey, base paler, lunule darker." Freyer, in his 'Neuere Beitræge,' &c., vol. iv., pl. 371, figures both sexes of this species. His fig. 1 represents a "male, of a pale greyish brown ground colour, quite grey at base, with a short dark basal streak under the base of the median nervure, a fine double black basal transverse line, followed by a distinct orbicular and large reniform, both outlined in pale; the claviform is distinct and dark brown; a double line runs from base of reniform to inner margin; a transverse row of small white dots, followed by a wavy line, near hind margin; median area mottled with brown, outer area very dark grey. Hind wings pale grey, with a distinct lunule and darker hind margin." His fig. 2 is a female, "marked like fig. 1, but a little darker in ground colour. Hind wings darker grey." Haworth's *secalina*, var. β ('Lepidoptera Britannica,' p. 210), would appear to be the darker form of this species, his α representing the type, his β representing the form with the \equiv -like mark under the stigmata. We have, therefore, only to deal with two forms:—

1. Without an \equiv -like mark and without a partially-developed central band, = *unanimis*.

2. With an -like mark and darker central area, = var. *secalina*, Haw.

Var. *secalina*, Haw.—Ground colour of anterior wings dark umber-brown, with the transverse lines as in the type. The claviform developed into an -like mark, which reaches from the transverse line before, almost, or quite, to that beyond the stigmata; the central area between these transverse lines, and above and below this dark mark, darker than the ground colour, forming an incomplete band from the costa to the inner margin. Hind wings grey-brown (as in type), with a distinct discoidal spot. The description of Haworth's *secalina*, var. β , is as follows:—"Alis anticis lineola longa nigra in medio fasciæ ut in sequente, stigmatæ antico oblongo magis antrorsum inclinante; posticis fuscis, ciliis rufo-cinereis" ('Lepidoptera Britannica' pp. 210, 211).

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

DORITIS APOLLO AT DOVER.—During our recent visit to Dover one of my sons was collecting along the edge of the cliff, some distance beyond the Convict Prison, when he was startled by the sudden appearance of one of these fine insects. It flew from the bank (which hereabouts closely abuts on the path) across the path to the edge of the cliff, where it hovered for several seconds, and then slowly sailed downwards out of sight. Owing to the precarious nature of the ground my son was unable to take a step forward to secure it (which otherwise he could easily have done), but he had a splendid view of the insect. On his return he informed me of the occurrence, minutely describing the specimen, mentioning its colour, the rounded wings, and red ocelli. Naturally he waited long in the hope that it might reappear, but it was not to be: and we visited the spot afterwards several times, but without avail. Whence the insect came, and how it arrived there, I of course cannot say; I merely record its occurrence. The date was the 28th of August last. I greatly regretted having that morning gone in another direction; had we been together, perchance we might have secured it.—E. SABINE; The Villas, Erith, October, 1889.

COLIAS EDUSA IN 1889.—In addition to the records of last month we have received the following:—

Kent.—I may mention that I saw a male taken at Folkestone, and know of many others that were captured there by visitors during August. I also saw a fine specimen of the var. *helice* that had been taken there by Mr. Austen of that town.—J. R. WELLMAN; 8, Medora Road, Brixton Hill, Oct. 4, 1889.—I am able to add that my brother and I saw several specimens of this species in clover and lucerne fields near Broadstairs, Kent, in August last. We captured two good males, but did not take any females.—HENRY A. HILL; 132, Haverstock Hill, London, N.W., Oct. 3, 1889.

Cambridgeshire.—On the 31st August, whilst out hawking near Great Chesterford, in Cambridgeshire, I saw eight *Colias edusa*, seven on a piece of waste ground, and one in a stubble-field near some lucerne. As I had not my net I was only able to take one.—HAROLD MANN; Houghton, 2, The Drive, Brighton, Oct. 4, 1889.

Cheshire.—A single specimen was taken by a boy near the city last August, and I have several records from Shotwick and neighbourhood.—R. NEWSTEAD; Chester.

Aberdeen.—I may mention the capture of a fine specimen of *Colias edusa* by myself on Sept. 14th, 1889, in a garden at Denmore, near Aberdeen. I never heard of it so far north before.—W. CATTO; Cote Town, Bridge of Don, Aberdeen, N.B.

VARIATION IN *VANESSA ANTIOPA*.—In his paper on the "Aberrations in the Genus *Vanessa*," in the September number of the 'Entomologist,' Mr. South describes several varieties of *Vanessa antiopa*. Another form of this species occurs here, in which the rich brown of the upper surface of the wings is replaced with dull smoky black; the usual blue spots are faintly represented on the primaries, and a few blue scales only on the secondaries; the yellow border, of normal width, is much obscured with smoky black, especially on the primaries; under surface not strikingly dissimilar from the normal form, except that the border is darker. Maynard's statement that the form *hygiea* occurs in about the proportion of one *hygiea* to five hundred of the normal form does not hold good here. The number of blue spots on the primaries sometimes varies. I once raised a whole brood of this species, some of which had but a single blue spot on the primaries, others lacked but one; and the remainder possessed a varying number between these extremes. Cases like this, where a whole brood of some species shows considerable variation from the normal form, present a very favourable opportunity to study the causes of variation in insects. Such instances are by no means rare; two such are mentioned in Mr. South's article, where broods of *Vanessa io* all emerged as varieties. If this were due to inheritance, a portion only of the brood would vary, and the cause is certainly to be looked for in some other direction. Where a large number of insects are confined in the same breeding-cage they are exposed to very much the same external conditions, and it is not remarkable that when one varies, all, or nearly all, will vary. When only one, or a very few, vary, and when all were exposed to the same conditions (light, heat, moisture, food, &c.), I think we will have to fall back on "spontaneous" variation or reversion.—FRANK M. JONES; Wilmington, Delaware, U.S.A., Sept. 23, 1889.

EPINEPHELE IANIRA, VAR. — At the meeting of the North Kent Entomological Society, on Sept. 12th, Messrs. Allbuary and E. Knight exhibited a beautiful var. of *E. ianira*, which they captured on the south-east coast in August. The body, legs, and antennæ are white, and the wings are creamy white, with a pink tinge in the centre. Unfortunately two of the wings are slightly torn; otherwise the insect is in splendid condition.—H. J. WEBB; 3, Gunning Street, Plumstead.

POLYOMMATUS PHLÆAS VAR. *SCHMIDTII*.—While at Folkestone in August I was pleased to find that my friend Mr. Giles's (of that town) younger son Frank had been so fortunate as to take, at the foot of one of the hills, a very fresh and perfect specimen of the silver variety of *Polyommatus phlæas*, and on my return home I saw another of the same variety, taken, I believe, somewhere in the neighbourhood of Croydon by a Master Long, of Streatham, but this was unfortunately not in such good condition as the one seen at Folkestone.—J. R. WELLMAN; 8, Medora Road, Brixton Hill, S.W., Oct. 4, 1889.

RHOPALOCERA IN MONMOUTHSHIRE.—On the 10th of August last I took two splendid specimens of *Vanessa c-album* at Tintern, in a clearing in a wood on the way from the village to the Devil's Pulpit. The place is just opposite the Abbey. I also took about twenty specimens of *Pararge egeria*, which was extremely plentiful. All of them were in very good condition. On August 19th I returned to Tintern for a day, having been to Cardiff, Swansea, and other places in South Wales in the meantime, and, visiting the same wood, I took another beautiful specimen of *V. c-album*. I also saw another very rubbed one. *P. egeria* was more plentiful than before, but there were very few good specimens to be got. *Argynnis paphia* was also plentiful on the blackberry-bushes, but it had evidently been out some time, as none of the specimens I captured were worth their carriage to the hotel. In the same place I also took *Epinephela hyperanthes*, *Pararge megæra* (extremely plentiful on one bank), *Lycæna icarus*, *Plusia gamma*, and a few other day-flying moths, besides all the commoner butterflies. *Gonepteryx rhamni* was fairly plentiful, also at Chepstowe. On August 20th I returned to Hertford. On August 22nd, as I was out hunting, I saw a single specimen of *Colias edusa*, but was unable to take it, as it was flying very fast and up a sharp hill. Sugaring has been of very little use here during August or the first half of September, the only insect I have taken at all worth having being *Catocala nupta*.—S. P. ANDREWS; 25, Castle Street, Hertford, Herts.

SPHINX CONVULVULI.—The following additional records of the capture this season of this species have been received:—

Devon.—This hawk-moth appears to be common this year. In 1887 seven were captured in one garden, and one pitched on some flowers which I held in my hand in broad daylight. In 1888 I captured several in my garden, and saw many more; and this year I have never failed to see one when watching for them, but although the wild bindweed is found almost everywhere in the hedges, I have never been able to discover traces of the caterpillar of this moth.—MARCUS L. BRIDGER, R.N.; Walton Leigh, Salcombe, S. Devon.

Leicester.—I took a specimen of *S. convolvuli* at rest on a gravestone in Leicester Cemetery on the 13th of September last.—C. B. HEADLEY; 2, Stoneygate Road, Leicester.

Hants.—Two specimens were taken at petunia flowers in the Isle of Wight on Sept. 11th and 12th.

Derbyshire.—In August last a *Sphinx convolvuli* was found asleep in a conservatory here. —R. C. BINDLEY; Mickleover Vicarage, near Derby, Oct. 16, 1889.

DEILEPHILA GALII, PARASITES ON.—The larvæ of this insect was so abundant last year that doubtless a goodly number of your readers have reared the perfect insect, or been disappointed by breeding parasites. It would, I think, be of interest to learn what hymenopterous and dipterous parasites have been bred from these pupæ. At present I only know two species, Ichneumonidæ, bred from them. The Rev. R. Peek, of Swelling, near Saxmundham, had fourteen pupæ from Aldborough, two of which were ichneumonised. From one he bred a specimen of *Tragus lictorius*, a very large and handsome species; from the other two *Amblyteles proteus*, Christ. These are both well-known parasites on the Sphingidæ, but I am not aware that *D. galii* has been recorded as one of their hosts, at least in this

country. Both these species are figured in Wood's 'Insects at Home,' the former under the name of *Tragus atropos*, the latter as *Ichneumon proteus*. —(Rev.) E. N. BLOOMFIELD; Guestling Rectory, Hastings, Oct. 10, 1889.

CHCROCAMPA CELERIO AT HARTLEPOOL.—On the 1st October I had brought to me a very good specimen of the above insect. It was taken on the framework of a greenhouse by a little boy. It is only very slightly rubbed at the tips of the fore wings. —A. WOODS; Alderson Street, West Hartlepool, Oct. 17, 1889.

DICRANURA VINULA.—Apropos Mr. Styles' note (Entom. 260), the following data of two broods, extracted from last year's diary, may be of some interest:—First brood: Ova laid, May 25th; hatched, June 12th; pupated, August 2nd. Second brood: Ova laid, June 28th; hatched, July 15th; pupated, Sept. 25th. The ova of the first brood were obtained from a female taken *in copulâ* on Blackpool sand-hills, and from this batch we bred a very nice variety, the zigzag markings on the fore wings being replaced by two irregular lines. We had a rather curious experience with the second brood. The female was bred from a larva of the previous year, and to obtain a male we "assembled." Although laying her full quota of eggs, only about a dozen hatched, the remainder proving abortive.—C. E. STOTT; Lostock, Bolton-le-Moors, Oct. 7, 1889.

STILBIA ANOMALA IN WALES.—While mothing at Barmouth, near Dolgelly, in N. Wales, last August, I took two specimens of *S. anomala*; I also caught a specimen when there two years ago. I have not seen that place mentioned before as a locality for *S. anomala*. —C. S. HOLDSWORTH; 32, Croxted Road, West Dulwich, London, Oct. 6, 1889.

LAPHYGMA EXIGUA IN HAMPSHIRE.—Whilst looking at some insects the other day belonging to my friend Mr. Druitt I observed two specimens of the above species, and in order to make sure of their identity I have shown them to Mr. Richard South and others, who at once identified them as *Laphygma exigua*: one is in beautiful condition, the other not quite so good. Both specimens were taken by Mr. Druitt at Christchurch, whilst sugaring in September, 1888.—J. M. ADYE; Oct. 12, 1889.

VIOLET COLOUR IN *HELIOPHOBUS HISPIDA*.—Neither Newman nor Stainton say anything of a violet tinge in the coloration of this species, and very recently it has been stated that the specimens from Torquay and Portland do not "show the typical violet coloration." As I have never to my knowledge seen Torquay examples of *hispida*, I must accept the dictum of those who have, but last year I was shown six specimens from Portland, and my impression was and is that they exhibited a violet shade, especially in the stigmata and pale central transverse markings. This year Mr. Nelson M. Richardson, of Weymouth, has been good enough to send me a nice series of Portland specimens, and in these I notice a decided tinge of violet, not so strong perhaps as shown in Hübner's figure, but nevertheless as well developed as in most of the continental specimens I have seen. Mr. Richardson has also very kindly sent me for examination two extreme aberrations illustrative of the opposite limits in the range of variation of this species in the Portland locality, and these specimens, together with his most instructive remarks thereon, throw light on that which had previously

mystified me greatly. I now apprehend that, although decidedly a variable insect, *H. hispida* is not the protean species I had been led to suppose it was, and that beyond a greater or lesser amount of pigment in coloration, and more or less intense markings, there is really no exceptional departure from typical lines, such, for instance, as possessing "a bifurcate transverse median line, extending under orbicular to the reniform and the central part of the basal nervures."—RICHARD SOUTH; 12, Abbey Gardens, St. John's Wood, N.W.

CATOCALA FRAXINI IN KENT.—Having noticed the announcement of one or two captures of *Catocala fraxini* this year, I think it may interest you to know that when sugaring in a garden on the banks of the Medway below Rochester on Sept. 1st and 2nd last year, one specimen came to sugar on each night, I should think probably the same insect on each occasion. Being a novice in Entomology, both nights being very dark, not having a box large enough, its shyness, and my natural excitement, it may be excusable that under the circumstances I was not clever enough to capture it. I searched the garden and walls early the following morning, but without success, and have not ceased to bewail my fate, as I do not suppose I shall have such a chance again. When I heard, during the second week of last month, that *C. fraxini* had been taken in other parts, I went to the Medway and sugared energetically, but not a moth of any kind, rare or common, came to the call.—MARK H. WINKLEY; 9, Glen Eldon Road, Coventry Park, Streatham, S.W., Oct. 1, 1889.

ENNOMOS AUTUMNARIA.—On Monday, 9th September last, whilst spending a day at Hayling Island, I took a female specimen of *Ennomos autumnaria* at rest on the gate-post of a private house within a short distance of the sea-shore. By a curious coincidence, on the following Monday morning, 16th September, I took a male specimen of the same species on a lamp-post in Portsmouth town. The insects, which I have carefully compared with the two specimens in the Doubleday collection, are of $2\frac{1}{2}$ and $1\frac{1}{2}$ inches expanse respectively.—C. B. SMITH; 58 Rectory Road, Stoke Newington, N., Oct. 10, 1889.

EMMELESIA UNIFASCIATA, DEFERRED EMERGENCE.—I was not aware that this species remained in the pupa-state for more than one year, but have found that such is the fact. In 1887 my kind friend Mr. Sheldon, of Addiscombe, handed me some pupæ, which all but about six emerged as imagines in 1888; but from these, six moths put in an appearance this year. Again, last season (1888) I obtained larvæ of *E. unifasciata*, which in due course changed into pupæ, and the perfect insects emerged in July last, with the exception of six or eight, which are still healthy-looking pupæ, and will, I suppose, remain over until next season.—J. R. WELLMAN; 8, Medora Road, Brixton Hill, S.W., Oct. 4, 1889.

LEPIDOPTERA OF TWO DORSET CHALK-HILLS.—Almost everyone is acquainted with the fact that Dorsetshire is rich in British and Roman remains, notably the splendid Roman encampments, every hill almost being capped with extensive earthworks; the entrenchments on some being to the present day more than thirty feet deep. Upwards of twenty such hill-fortresses are known upon the north and south downs of the county, and in the vicinity of most are usually to be seen the remains of

barrows, and other places of ancient burial; I say remains, because nearly all have been despoiled of their contents, such as urns, bronze-daggers, sword-blades, &c. It is upon the sites of these ancient earthworks that many Lepidoptera may be found. Upon two of the northern hills, viz., Hambledon and Hod, which are divided from nearly all the others by the River Stour, I have worked for Lepidoptera, especially Diurni, for the last seven years, with a fair amount of success. I may, however, mention that I have never met with a collector there, so imagine the district to be devoid of entomologists. The hills are easily reached from all parts of the county, booking by the Somerset and Dorset Railway to Shillingstone, and from thence, a pleasant walk of about two miles, to the top of Hambledon, which is about 800 feet high. Then one makes way towards the southern slopes, when operations can be commenced by netting the following:—*Melanargia galathea*, *Pararge egeria*, *Epinephele hyperanthes*, and var. *arete* (common), *Hesperia sylvanus*, *H. thaumas*, *H. comma*, the latter very abundantly; I have never seen it in such profusion anywhere else. Amongst hazels, &c., *Thecla rubi*, occasionally *Argynnis paphia*, *A. euphrosyne*, *A. selene*. Amongst the moths I have taken several *Toxocampa pastinum* and *Zygæna trifolii*; also some common species which I will mention shortly, but I do not think there is much to be done upon this hill. No doubt the best locality is upon Hod Hill, which is separated from Hambledon by a narrow valley, and is in full view of the collecting-ground just described. Ascend until the second entrenchment is reached, forming a miniature valley. It is along here the species are most numerous, and where I have taken the following:—*Colias edusa* (several), *Gonepteryx rhamni*, *Satyrus semele* (abundant), *Vanessa io*, *V. atalanta*, *V. urticae*, *V. cardui* and larvæ, *Syrichthus malvæ*, *Nisoniodes tages*, *Lycæna icarus*, *L. minima* (only four), *L. corydon*, *L. bellargus* (two last very abundantly), *Zygæna filipendulæ*, *Ino statice*, *Botys flavalis*, *Pyrausta purpuralis*, *Ennychia nigrata* and an allied species with bars straight; *Chærocampa porcellus* and *Nemeophila plantaginis* are very common, males flying freely during sunshine, and often to their cost, as I have watched the swifts (*Cypselus apus*) feeding upon them, even two or three sometimes being caught at a sweep by one of these birds. I have not observed them treat butterflies in a similar manner. Species found upon both hills are:—*Pieris napi*, *P. rapæ*, *P. brassicæ*, *Euchloë cardamines*, *Cænonympha pamphilus*, *Polyommatus phlæas*, *Pararge megæra*, *Epinephele ianira*, *E. tithonus*, *Argynnis aglaia*, &c. By the above notes it will be seen that several species found upon Hod do not occur upon Hambledon, and vice versa. The list is small, but no doubt it could be enlarged; still thirty-three out of our limited number of butterflies are to be found on these two hills. In conclusion I may mention that I visited Hod in the first week of September last, and took several of the second brood of *Lycæna bellargus*; of *L. corydon* I captured seven perfectly fresh males and two females, and saw several others on the wing, but worn; *L. icarus* and *L. astrarche* were fairly common. — I. H. FOWLER; Grove Road, Wimborne, Oct. 1, 1889.

LEPIDOPTERA OF THE NEW FOREST.—I was at Lyndhurst from July 31st to August 5th last, and consequently I read Mr. Blaber's "Notes from the New Forest" (Entom. 261) with a good deal of interest. To the list of butterflies given by Mr. Blaber I am able to add a few other common species which I came across during my visit, namely, *Lycæna icarus* and *L. agestis* (both in bad condition), *Hesperia thaumas* and *H. sylvanus*.

(fairly good), and one or two worn-out *Melanargia galatea*. I also saw a couple of very dilapidated *Limenitis sibylla*, and a few worn specimens of *Argynnis adippe* turned up. *A. paphia* was pretty common, but in very bad condition. I can fully corroborate Mr. Blaber's statement as to the failure of sugar: the only insect which came to my sugar was a specimen of *Catocala promissa*, which I unfortunately failed to secure. I may add that I took several male and two female specimens of *Selidosema ericetaria* (*plumaria*), but they (like most of the other Lepidoptera which I saw) were not in good condition.—HENRY A. HILL; 132, Haverstock Hill, London, N.W., Oct. 3, 1889.

FUNGUS PARASITIC ON INSECTS.—My son writes from Paraparaumu, New Zealand (North Island), under date March 16th, 1889, as follows:—"I have obtained a veritable entomological curiosity for you from the mountain ranges on the west coast of this island, facing Cook Straits. It consists of a dark olive-green caterpillar, about three inches long, which, when full-fed, drops or descends from the trees, ostensibly to enter the ground for the purpose of pupation, but which process seems to be arrested by some unknown or mysterious cause, and instead of becoming a pupa, a twig-like plant, sometimes forked, about four or five inches in length, grows, apparently indifferently, either from its head or tail. The Maories pointed the caterpillars out to me, and informed me that they had received £1 for a pair a short time ago from a gentleman who was returning to Europe, and wanted them as a curiosity." No doubt the plant-like appendage to this larva is of fungoid origin.—GEO. J. GRAPES; Berkeley Villa, Charlwood Road, Putney, Sept. 13, 1889.

[Mr. Grapes has been good enough to send for examination the specimens described by his son. They prove to be a well-known fungus, *Torrubia robertsii*, which attacks certain larvæ in New Zealand. We have some of the allied fungi of small size in this country. In the 'Entomologist' for June, 1878 (vol. xi. 121) the British species is figured, and is accompanied by an interesting article by Dr. Buchanan White, who mentions the species sent by Mr. Grapes.—J. T. C.]

CECIDOMYIA LYCHNIDIS (*Heyd.*).—I have met with the larvæ of a Cecid during the autumn months frequenting the upper flower-knops and capsules of the *Lychnis dioica*. I may remark that the stigmatous flowers of the *Lychnis* were affected by the larvæ, which were in fair quantity. Kaltenbach speaks of the larva as occurring at Frankfort-on-the-Maine in similar woolly, deformed knops, and says that the gnats appeared in July. With me they did not emerge till September. Like so many of our Cecid larvæ, they are of a pale yellowish red when matured. The gnat is yellow. The wings are sparingly covered with dark pile, and show the characteristic nervures. I bred fully a dozen, both males and females.—PETER INCHEBALD; Grosvenor Terrace, Hornsea, Oct. 11, 1889.

CANTHARIS VESICATORIA AT WIMBORNE.—I caught a perfect specimen of *Cantharis vesicatoria* upon an oak-leaf last June; it is about the size of an ordinary male "Spanish fly." Is this a rare beetle in England?—I. H. FOWLER; Grove Road, Wimborne, Oct. 1, 1889.

INFORMATION WANTED.—Will any readers of the 'Entomologist' kindly give me particulars as to the geographical range in Britain of the

typical forms and varieties of the following species :—*Celana haworthii*, *Grammesia trigrammica* (*trilinea*), and *Apamea fibrosa* ! The information is wanted in connection with the series of papers on varieties of Noctuæ now appearing in the 'Entomologist.' I am already indebted to a large number of lepidopterists for useful communications, but I would point out that I get twice the number of communications *after* the species has been dealt with in the 'Entomologist' than before. If those interested would write me a short note on any variation they may have observed in any species about a month or two before such species would be noticed, I could embody their information, and make it generally useful. At present I should be glad of any information regarding *Mianas* and *Caradrinidæ*, a little later of the *Agrotidæ*, and so on. Apparently unimportant phases of variation should be mentioned.—J. W. TUTT.

ERRATUM.—On page 243, line 4 from bottom, read "males" instead of "females."—T. H. HALL.

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — October 2nd, 1889. — The Right Hon. Lord Walsingham, M.A., F.R.S., President, in the chair. Mr. Arnold Umfreville-Henn, of Heaton Chapel Rectory, near Stockport, was elected a Fellow. Mr. F. P. Pascoe exhibited a number of species of insects of all orders, collected by himself during the past summer at Brindisi, and in Greece and the Ionian Islands. Mr. J. W. Douglas sent for exhibition specimens of *Lygus viscicola*, Puton, a species new to Britain, taken at Hereford, in September last, exclusively from mistletoe, by Dr. T. A. Chapman. Mr. R. M'Lachlan exhibited nearly one hundred specimens of Trichoptera recently collected in Iceland by Mr. P. B. Mason. Only six species were represented, and of these five had been previously recorded from the island. He remarked on the great amount of variation existing in some of the species. Mr. E. B. Poulton exhibited a mounted specimen of the yellow powder from the cocoon of *Clisiocampa neustria* under a power magnifying 188 diameters. The powder was thus seen to consist of crystals so minute that the form could only just be made out. He said the powder was present in a crystalline form in the malpighian tubules, and was discharged from the anus of the larva. A discussion ensued as to the functions of the malpighian tubes, &c., in which Mr. Stainton, Lord Walsingham, Mr. M. Jacoby, Mr. P. B. Mason, Mr. M'Lachlan, and Dr. Sharp took part. Mr. Poulton also exhibited some photographs of living larvæ of *Hemerophilla abruptaria*, showing different depths of colour which had been induced by experiment; specimens of the larvæ preserved in spirit were also shown, together with water-colour representations of two varieties. He said that, as in other experiments of the kind, the larvæ had been rendered very pale by being surrounded by green leaves and stems only, whereas they became extremely dark when numbers of dark twigs were intermingled with the leaves of the food-plant. All were bred from eggs laid by the same female. Mr. F. Merrifield said that Dr. Chapman had recently obtained similar results from experiments on the larvæ of *Ennomus alniaria*. The Rev. Dr. Walker exhibited, and read notes on, a number of Coleoptera, Neuroptera, Hymenoptera, and Diptera, which formed the second instalment of the collection he had recently made in Iceland.

Mr. R. South exhibited a specimen of *Luperina testacea*, bred from a pupa found at the root of a species of *Silene* at Eastbourne; also a specimen of *Luperina nickerlii*, Freyer, caught in Lancashire last August. He also exhibited, and read notes on, a long series of *Boarmia repandata*, the offspring of parents bred from larvæ collected in North Devon. Mr. Poulton, Mr. Merrifield, and Lord Walsingham took part in the discussion which ensued. Mr. J. J. Walker, R.N., exhibited a number of Coleoptera collected during the past summer in Cobham Park, Kent. Thirty-three species were represented, amongst which were the following, viz., *Eros minutus*, *Philonthus fuscus*, *Homalota hepatica*, *Abræus granulum*, *Anisotoma grandis*, *Agaricophagus cephalotes*, *Thalycra sericea*, *Cryptophagus ruficornis*, *Platytarsus setulosus*, &c. He also exhibited a living larva of *Helops caruleus*. Mr. Jacoby exhibited a curious phytophagous beetle found by Mr. J. H. Leech in the Corea. He stated that he was unable to determine the genus, as was also Mr. J. S. Baly, to whom he had submitted the specimen. Mr. R. Adkin exhibited specimens of *Retinia resinella*, received by him from Forres. Lord Walsingham remarked that he had never seen the species in Scotland, but that it was not uncommon in Germany, and he had found it at Hamburgh. Mr. W. Dannatt exhibited a male specimen of *Papilio antimachus*, Drury, from Lukolela, a missionary station about 500 miles from the mouth of the Congo. He stated that the species, although very rare, had a wide range, as three other specimens of it had been received from the Stanley Falls, which were more than 800 miles further up the Congo. Lord Walsingham exhibited preserved specimens of the larva and imago of *Cidaria reticulata*, from the Lake District, sent to him by Mr. Hodgkinson. Mr. W. White stated that as some doubt had been expressed at the last meeting as to whether the specimen of *Nephronia hippia*, Fab., var. *gæa*, Feld., which he then exhibited, was hermaphrodite, he had, with Mr. Griffith's permission, handed the specimen to Mr. G. T. Baker for dissection. Mr. J. Jenner Weir exhibited fore wings of the males of *Argynnis paphia*, *A. adippe*, and *A. atlantis*, denuded of the scales, in order to show that there was no dilatation or thickening of the median nervules and submedian nervure in that sex of these species; but that the apparent dilatation was produced by a dense mass of scales crowded together on each side of the nervules. He also read a short paper on the subject entitled, "Notes on the nervules of the fore wings in the males of *Argynnis paphia* and other species of the genus."—H. Goss, *Hon. Sec.*

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.
—September 26th, 1889. T. R. Billups, Esq., F.E.S., President, in the chair. Mr. J. T. Williams exhibited *Cucullia absynthii*, from Portland. Mr. Wellman, *Plusia chryson* and *Dasydia obfuscaria*. Mr. Jäger, Lepidoptera from the Lake District and the Isle of Man; among those from the last-named place were some interesting forms of *Polyommatus phlaeas*, and a small dark form of *Pieris napi*, which species Mr. Carrington said was usually dark in that locality. Mr. Carpenter, *Gnophos obscuraria*, and varieties of *Bryophila muralis*, from Folkestone. Mr. Tugwell, a long series of varieties of *Peronea hastiana*, bred from larvæ collected at Braemar, Aberdeen. Mr. Ince, Lepidoptera from Switzerland. Mr. Adkin, a series of *Hypermercia angustana*, bred from larvæ found feeding in shoots of willow collected in Co. Derry, Ireland. The specimens showed considerable variation, some having the ground colour of the primaries silvery, and the

usual reddish brown central fascia and costal patch intensified; while in others the colour of these markings was almost entirely replaced by dull grey. And from the same locality, *Pædisca semifuscana*, which also showed variation both in the colours and markings of the specimens. Mr. Jenner Weir, chrysalids of *Pieris napi*, to show that, although their colour was very much affected by the environment of the caterpillar at the time of their metamorphoses, yet in no way did their colour approximate that of their surroundings; they were all the produce of one female of the species: those that had changed to chrysalids in an ordinary breeding-case with perforated zinc sides were of a dull cream-colour with black spots, and those that had metamorphosed in a tin gentle-box, with the usual perforations at the top, were of a beautiful apple-green with black spots; they had all been reared from eggs and fed up in a breeding-cage, and those that had become chrysalids in the gentle-box had been placed there a few days before. A discussion ensued, Messrs. Carrington, Tugwell, White, South, Auld, and Weir taking part. Mr. Turner exhibited a varied series of *Triphana pronuba*, and said that he was in doubt as to which was the var. *innuba*, but that the variation of the species was similar to that of *T. comes*. Mr. Billups, on behalf of Mr. Tearoe exhibited *Apanteles jucundus*, from Deal.

October 10th, 1889.—The President in the chair. Mr. Weir remarked that at the last meeting he exhibited chrysalids of *Pieris napi*, when it was thought by some of the members that the apple-green specimens would, if placed in a strong light, lose their colour. He now exhibited the same chrysalids, which had been exposed for weeks to the direct rays of the sun without the slightest fading in the green colour. Mr. Wellman, light forms of *Gnophos obscuraria*, from Lewes, and it was stated that this light form was only to be met with in that locality; but Mr. Tutt remarked that he had taken one example at Folkestone. Mr. South, referring to Mr. Turner's query as to *Triphana pronuba* and its var. *innuba*, stated that in the variety the wings and thorax were concolorous. He also exhibited a variety of *Luperina testacea*, and a specimen of *L. nickertii*, Frr., the latter received from Mr. Baxter, of St. Anne's-on-Sea, Lancashire; also a long series of *Triphana comes*, and read notes on the marking of the secondary wings. Mr. Carpenter, *Pterostoma palpina*, from Essex, and *Neuronia popularis*, taken at Streatham. Mr. Oldham, several species of Lepidoptera from the Cheshire Mosses. Mr. R. Adkin, examples of *Ellopiæ prosapiaria* and *Boarmia abietaria*, and referring to the view held by some entomologists that larvæ fed upon one particular plant would not readily take to another, said that the larvæ of the last-named species were obtained from fir, and at first fed upon fir and yew, but, upon some birch being put into the cage, they immediately left the other two plants and fed exclusively upon it. Messrs. Carrington, Tugwell, Weir, Cooper, South, J. A. Clark, and others made observations relative to this subject. Mr. Adye, *Sphinx convolvuli*, taken at Christchurch. Mr. C. A. Briggs, an albino form of *Epinephele tithonus*. Mr. Cooper, a bred series of *Deilephila galii*, and stated that he had not been able to find any larvæ of this species during the autumn; Mr. Tugwell said this agreed with his experience. Mr. T. R. Billups, a living specimen of *Gryllotalpa vulgaris*, from Poole, and contributed notes. Other exhibits were made by Messrs. Turner, Step, Frohawk, A. E. Cook, and Fremlin.—H. W. BARKER, Hon. Sec.

REVIEW.

The Butterflies of the Eastern United States and Canada, with special reference to New England. By SAMUEL HUBBARD SCUDDER. Three volumes. Cambridge, Massachusetts, U.S.A.

A provisional review of this work was given in the 'Entomologist' for last year (pp. 327-28), on the publication of the first number; the completion thereof, by the appearance of the twelfth and concluding part, affords a convenient opportunity again to revert to it. It would be difficult to over-estimate the great scientific value of Mr. Scudder's *magnum opus*, and all who study it would agree with him that it is "the most exhaustive faunistic work on any insects of any part of the world." These words, however, but feebly convey the great merit of the three volumes; to the biologist, and more particularly to the evolutionist, the manner in which the early stages of the species are dealt with affords material for judging of the relations of the groups of butterflies comprised in the work to each other. For instance, there are three plates of the eggs and an equal number of the micropyles of the eggs, and four of the caterpillars at birth, three of the caterpillars' heads at different stages, and four of the mature caterpillars; then the chrysalids are figured in three plates, and miscellaneous structural details, mostly of the early stages, are figured in two more plates. Besides all this, the neurulation of the wings is shown in five plates, and the male abdominal appendages in five more. Great importance is attached by Mr. Scudder to the "scale-patches and folds of the wing-membrane found in the male butterfly," and to the "androconia or scales peculiar to the male sex." The letterpress on these subjects is extensive, and the details of such peculiarities are given in no less than nine excellent plates, many of the figures being highly magnified. Altogether there are eighty-nine plates and three coloured maps, besides portraits of distinguished early American entomologists.

The great charm of the work consists in the manner in which all the dry details are enlivened by the interpolation of an "Excursus"; of these enjoyable essays there are seventy-six scattered through the two first volumes.

The limits of this review preclude the possibility of giving even an outline of the subjects dealt with in these instructive excursi, which are of a most varied character; they deal with butterflies in almost every aspect in which they can be studied, for instance, their ancestry, sexual diversity, ornamentation, geographical distribution, origin of varieties, melanism, albinism, &c.

In a work which has been so admirably performed, it is invidious, perhaps, to draw attention to any shortcoming; but the European student will regret that the author did not see fit to carry out what had once been his purpose, "to make extended comparisons of the species described with their nearest allies outside the region concerned."

The work may be safely commended as full of instruction to all classes of entomologists.—J. J. W.

THE ENTOMOLOGIST.

VOL. XXII.]

DECEMBER, 1889.

[No. 319.]

PARARGE MEGÆRA.



PARARGE MEGÆRA.

THE very singular specimen of *Pararge megæra*, depicted above, was captured by the late Colonel Cox, of Fordwich, Kent, probably near his residence, as the species used to swarm in the neighbourhood formerly, though now it is less common.

In this example the second nervure of the median vein in each wing is wanting, and, as I have noticed in other insects, when this is the case an additional or enlarged ocellus takes its place towards the hind margin. The spur, which usually runs from the central bar towards the end of the inner margin in the male, seems more to follow the facies of that of the female, and thus forms a band across the fore wing. The usual ocellus is double, with a small dot above. In the secondaries the second and third ocelli unite, and their usual central white dots join into a line, one-twelfth of an inch long. Beneath, the upper wings show respectively six and five ocelli or dots, and the hind wings five and six. The specimen is a male.

In the same cabinet is another specimen without any of the usual tawny colouring near the thorax, the whole of the first two-thirds of the wing being the same colour as the transverse markings.

SYDNEY WEBB.

Maidstone House, Dover, October, 1889.

NOTE ON PARASITES OF *ATHERIX IBIS*, FABR.

My attention has been called recently to the interesting contribution, by Mr. T. R. Billups, on the habits and parasites of *Atherix ibis*, published (p. 193) in August number of the 'Entomologist.'

I was particularly interested in his descriptions of the two hymenopterous parasites reared from it, and write now to correct the generic position assigned them.

Mr. Billups is certainly in error in his generic determinations of these parasites. Figures 5 and 6 do not belong to the genus *Teleas*, but to the genus *Trichogramma* in the family Chalcididæ, sub-family Trichogramminæ. I have reared various species of this genus in America from lepidopterous, hemipterous, and homopterous eggs; also from Coccids. *Teleas*, although an egg-parasite, is widely different, and belongs to the family Proctotrupidæ, sub-family Platygasterinæ. The genus is known at once by having a distinct marginal vein and an oblique stigmal vein, while the hind wings are wider, and the antennæ differently shaped.

Figures 3 and 4 do not represent male and female of a species of *Antæon*, but are male and female of a species of *Megaspilus* in the family Proctotrupidæ, sub-family Ceraphroninæ. I have reared species of this genus from Aphids and dipterous puparia. *Antæon* is a Proctotrupid genus in the sub-family Dryininæ, and shows but a superficial resemblance to *Megaspilus*. It is at once distinguished from it by its more highly developed venation, the front wings having two basal or brachial cells. The genus is probably parasitic on homopterous insects, like an allied genus *Gonatopus*.

W. H. ASHMEAD.

U. S. Dept. of Agriculture, Washington, D.C., Aug. 14, 1889.

[It is pleasing to find that the 'Entomologist' is so critically read by members of the U. S. Dept. of Agriculture, Washington, and I am obliged to your correspondent, Mr. W. H. Ashmead, for calling my attention to the error respecting the genus *Teleas* (Entom. 194), which most possibly is incorrectly named; but, as regards Nos. 3 and 4, I sin in very good company, the insects having been submitted to the Rev. T. A. Marshall, and by him determined as *Antæon alorus*.—T. R. B.]

DESCRIPTION OF TRICHOGRAMMA. Plate 7, figs. 5, 6.

When I drew the figures, illustrated on plate 7 of this volume of the 'Entomologist,' I took careful descriptions of the living insects under consideration. Appended are my notes:—

Fig. 5.—Male, apterous. Antennæ nine-jointed, not including the basal short joint, to which the first long肘ed joint is united; second joint wider, about half the length of first, and pear-shaped; third joint the smallest, very small and collar-like; fourth and fifth of equal size and round, same thickness as the first; the remaining four united as one, forming a club. Head wider than either the thorax or abdomen, closely and firmly set on the thorax. Wings quite rudimentary, merely scale-like, and visible only under high microscopic power. Abdomen slightly wider than the thorax; anal segment furnished with bristles. Legs very muscular, well adapted for leaping. Colour pale ochreous, excepting the abdomen, which is dark brown, inclining to black. Size, the merest speck, only just visible to the naked eye, one hundredth part of an inch being somewhere near the size.

Fig. 6.—Female. Antennæ same as male. Head round, and much smaller than that of the male, and slightly wider than the thorax. Wings: primaries ample and rounded, costal vein only running along the costa, turning before reaching the middle of the costal margin, and then running towards the middle of the wing; the very minute scale-like hairs are arranged in a series of lines, giving a vein-like appearance; fringes long. Secondaries long and narrow, without veins, only one row of scales down the centre; fringes longer than those of the primaries. Legs muscular. Colour: antennæ and legs pale ochreous; head, thorax, and abdomen shining black; costal vein very pale brown; scales on the wings dusky. Size, considerably larger than the male.

Many pairs emerged (from the mass of dead flies, *Atherix ibis*, and their ova) on several consecutive mornings, but they lived only for a few hours. I watched them copulating several times, which process lasts for not more than fifteen seconds. The males are very active, the females more sluggish, when touched, leaping for about half an inch, apparently not using the wings.

F. W. FROHAWK.

Balham, S.W., 1889.

NOTES FROM THE NORTH-WEST COUNTIES.

By J. ARKLE.

WITH a preceding season like last year's—marked as it was by extraordinary rainfall, low temperature, and early frost—it could hardly be expected that 1889 could be very prolific in Lepidoptera. At any rate my anticipations for this district were not high, and I find their verification to be at least on the same footing as the notes of disappointment which reach me from far

off as well as near correspondents. Still, though hunting has been marred by rain, tempest, and scarcity of quarry, it has been my good fortune to meet, during the season, with extraordinary insects, as well as with entomological matters of interest.

Beginning with Delamere Forest, in Cheshire, the comparative scarcity of *Nyssia hispidaria*, in the early spring, looked like an index to what had apparently been the generally observed character of the year. But later on, at the end of May, three specimens of *Orthosia suspecta*—taken at rest on oak-trunks—amply compensated me for the rarity of *N. hispidaria*, especially as *O. suspecta* figures hitherto unrecorded for the Chester Natural History Society's District,

One or two visits followed during the month of June,—a month which stands out in pleasant recollection as being perfect in warmth and sunshine,—still, the greenwood was so deserted by lepidopterous, and I may add by coleopterous, insects, that I determined to take up an abode near its shades, for a few days, as a thorough test. Here and there one comes across a few scattered houses, where the inmates tell graphic stories of nightly "mosquito" miseries. Forewarned, I therefore chose my lodging outside the wood, and on high and open ground, with every desired result. This visit began on the 11th of July, and from this date the weather completely broke down. Days of rain and lack of sunshine followed each other, until I packed up and returned on the 14th. My captures were—a larva of *Eugonia erosaria*, taken on the trunk of an oak, and now a fine imago; one *Geometra papilionaria*; a dozen or more *Pseudoterpna pruinata* (*cytisaria*), which, by the way, only showed in a few cases the ochreous colour supposed to be due to emergence in wet weather; a series of *Crambus margaritellus* (a plentiful insect, and in fine condition); *Tortrix sorbiana*, *T. ministrana*, *Penthina pruniana*, *Phycis carbonariella* (*fusca*), *Depressaria yeatiana*, and a couple of *Cænonympha typhon*. The scarcity of the latter insect is, I fear, in some measure due to over-collecting since its habitat became so generally known.

My other Delamere captures may be briefly summed up in the following list:—June 22. *Nemeophila russula*, plentiful and fresh from the chrysalis, and early by a fortnight or three weeks; *Cymatophora duplaris*, a few; a couple of *Eucosmia undulata*; *Lomaspilis marginata* in plenty, by a row of willows; *Lycæna ægon*, fairly numerous; but the well-known forms, such as *Aplecta nebulosa*, *Drepana falcataria*, *Ellopiæ prosapiaria*, *Macaria liturata*, *Melanippe montanata*, *M. sociata*, *Thera variata*, *Cabera pusaria*, and *Metrocampe margaritaria*, were extraordinarily rare. Among butterflies the common Whites—usually so conspicuous among the greenness—I failed to notice at all. *Cænonympha pamphilus* and *Polyommatus phlæas* even appeared to be less

numerous than in previous years. Here, as well as elsewhere in the district, *Plusia gamma* was in such numbers as to be a frequent nuisance to the collector, although its usual colleague, *Vanessa cardui*, had been comparatively scarce.

On August 17th I beat from alder a larva of *Drepana falcataria* and a dozen or more caterpillars of *Hadena adusta*, as well as an imago of *Peronea aspersana* from bog myrtle (sweetgale). Larvæ of *Hadena pisi* were also plentiful on this shrub.

My last visit to the Forest was on the 5th of October, when I found an *Agriopis aprilina* drying its wings on an oak; a few more *H. adusta* larvæ; and I beat a score of *N. russula* caterpillars off the sweetgale. I tried, by warmth and fresh food,—plantain for *H. adusta* and lettuce for *N. russula*,—to overcome the disposition of these creatures to hibernate, but the instinct was too strong: *H. adusta* persistently turned in to winter quarters,—each forming a hybernaculum in the soil,—and *N. russula* betook themselves to the gauze covering of their flower-pot, where, for the last fortnight, they have remained motionless in an inverted position. Three captures, on October 5th, of the richly coloured *Peronea mixtana*, and one of the ochreous *Lemnatophila phryganella*, complete this representative list.

A few notes for Chester may now follow those of Delamere. In the early spring the sallows in the immediate neighbourhood showed a marked falling off among the common members of the *Tæniocampa* family. *T. gothica* and *T. stabilis* were most frequently seen; the others were barely represented. In Caughall Lane, an unfrequented bridle-road about four miles from the city,—with a wide stretch of sloe, hazel, willow, and brier wilderness on each side,—I came across a number of night-feeding larvæ on the evening of May 4th. From these I bred fine specimens of *Boarmia repandata*, *Noctua augur*, *Triphæna interjecta*, and *T. orbona*. This night-searching for larvæ of Lepidoptera is very interesting work, and remunerative also. One seldom gets *T. interjecta* fine when caught as a moth. During the night I netted, flying over the grass, a moth I have been thoroughly puzzled with. It has, up to the present, remained unidentified.

The neighbourhood of Chester has, deservedly I think, a bad reputation for "sugaring." I tried the process frequently in June, but, as usual, without success. On the 18th of May, at Huntingdon Wood,—another of our "localities," and situated about a couple of miles away,—I took, flying over a sedgy ditch, a number of *Apamea unanimitis*. The moth confines itself to this spot, the probable reason being the presence of its food-plant. *Acidalia remutata* and *Emmelesia decolorata* were also among my captures on this occasion. On the evening of July 2nd, in the Nurseries of Messrs. Dickson and Co., I netted a number of

Platyptilia gonodactyla, flying over the flowers of a species of yarrow.

Why there should have been something like a general expectation—not by any means confined to this district—that we were going to have an “*Edusa* year,” I am unable to say. Our last *Edusa* advent occurred in 1877, when the butterfly was freely taken in June and September. But, as if in defiance of all attempts at fixing another “year” for 1887,—that is, after a mathematical ten years,—the insect ever after refused to show itself. However, strangely enough, I am able to report a capture of, at any rate, one specimen—on the usual sunny, flowery kind of bank the insect loves so well—close to Chester. But more about *Colias anon*.

A more wretched autumn for collecting I do not remember than the present one. The only method practicable, as far as rain and east winds will permit, is that of working the gas-lamps after dark; but even lamp moths have been far from plentiful. I took about the usual numbers of *Eugonia alniaria* (*tiliaria*) and *Anchocelis lunosa*, but *A. pistacina*, *Luperina testacea*, *L. cespitis*, *Orthosia lota*, *Hydræcia micacea*, and *Neuronia popularis* have been few indeed. As I write, *Himera pennaria* and *Hybernia defoliaria* are to be seen occasionally on the gas-lamps. In June I took two or three specimens of *Phibalapteryx vittata* (*lignata*), and, in the early autumn, amongst other *Micros*, a long series of the pretty *Paraponyx stratiotana*, all from the lamps.

I will now take the reader back to a beautiful day in spring, when, dashing along by rail into North Wales, I continued a long series of attempts at an acquaintance with *Agrotis ashworthii*. It will be understood this is a moth of which it may metaphorically be said that too much should not be told in Gath or published in Askelon. In the same carriage I met a stranger,—a hale, but aged, Welsh minister, who must have been close upon three score years and ten,—and little did I imagine he possessed the key to my puzzle. As the train ran through the green fields and pleasant sunshine we chatted together, as well as my ignorance of Welsh and his limited English would permit, but without touching upon Entomology. By-and-bye we left the train at a wayside station, and bade each other good morning. For the next few hours I worked hard among the slate and limestone mountains, but without success. Just as I was about to give up the task for the day, I was surprised at an unexpected sight again of my reverend friend; and, as I thought some explanation might be opportune, I remarked that I was searching for the larvæ, after hybernation, of a certain insect. To my further surprise he at once quoted the species, but added that my endeavours could be of no avail. He then very kindly directed me to a house, across the valley, where I should find a farmer who had, in his day, collected numbers of *ashworthii* larvæ.

Away I started, and, in climbing up towards the dwelling, I fortunately met a young fellow who turned out to be the farmer's son. With the view of saving time I broached the *ashworthii* question, and he ultimately guided me to the haunts of this local insect. These were simply beetling limestone cliffs, inaccessible to all but a native. With a challenge to "Come on," he at once began the ascent of one. Thinking he only meant climbing up a yard or two I followed, but, with a discretion commensurate with the weight of years, I soon felt a strong wish to descend, and was thoroughly satisfied at accomplishing it. Higher and higher went my friend, until I cordially wished all *ashworthii* at the bottom of the sea. I begged him to come down, but he coolly replied that the only safe way was to return by an easier path from the top. I have no wish to dwell upon the next hour or so, but, to my great relief, he reappeared walking coolly towards me on my own level. He had two *ashworthii* larvæ, but—bleeding hands as well! The caterpillars he had ferreted out from the crevices in the cliff, where, being night-feeders, they secrete themselves by day. The conversation which ensued—all about this rare moth, its collectors, and its dealers—would make a book. By-and-bye my young friend introduced me to an individual who finds a harvest during the season in which the larvæ of this beautiful insect feed. From him I obtained ten caterpillars, and at the close of the day I possessed thirteen, only one of which I took personally,—all the others, as the reader will have guessed, being simply cash transactions. I cannot close these remarks without bearing testimony to the accurate description of the insect given by the late Mr. Newman in his 'British Moths.' On one point alone does my experience differ from it, *viz.*, that all my eleven imagos (two larvæ died) emerged between June 26th and July 3rd, instead of August; but this may be accounted for by the fact—explained no doubt by the splendid June—that all insects have been, more or less, unusually early this season. I found my caterpillars very easy to rear, and, as Newman observes, to revel on sallow.

My record for Wallasey is soon told. I had promised a correspondent some *Teniocampa opima* eggs, and accordingly reached the sandhills on May 18th. Two gentlemen from Bolton joined me in a careful search on the dead ragwort stems, but it was evident these had all been examined long before. At last one of my companions discovered a small batch on an overlooked thistle, and he very kindly shared the eggs with me. The only insects we saw were *Mesotype virgata* (*lineolata*) and *Herbula cespitalis*.

Three times during August did I make a careful examination for *Deilephila galii* larvæ. Like other entomologists who have, this year, sought there for the caterpillars, I did not come across a single trace.

On July 25th I started for a week's collecting in North Lancashire, and across the River Kent into Westmoreland. Rain, as usual, with a scarcity of insects, were the great drawbacks. At Heysham Moss, near Morecambe, I found *Cænonympha typhon* all but over, and *Hyria muricata* (*auroraria*) and *Acidalia fumata* entirely so. My captures were four *C. typhon*, a long and fine series of *Carsia paludata* v. *imbutata*, half-a-dozen fresh *Anarta myrtilli*, and at Hest Bank, a beautiful specimen of *Larentia salicata*. The larvæ of *Vanessa cardui*, *V. atalanta*, and *V. io*—usually so conspicuous here at this time of the year—were entirely absent, owing, I was informed, to the early season. At Witherslack we joined our old friend Mr. H. Murray, whose extraordinary powers of getting across country I observed, as usual, with mixed feelings. Crossing the estuary of the Kent, we proceeded on our way along the embankment which keeps the swollen waters of that river from the surrounding fields. This bank is everything the entomologist can wish for,—sunny, and well clothed with plants and flowers. The day, however, was dull, and our low expectations were such that when a yellow insect started up it was put down as a disturbed *Rumia luteolata* (*cratægata*). By-and-bye another got up; a dash was made for it, but, in reality, it was allowed to escape. After a mile or so we got off the embankment, and took a lot of the pretty *Crambus inquinatellus* and *C. geniculeus*, as we disturbed them from a growth of St. John's wort. The chief insect of our search was *Sciaphilus penziana*,—a thoroughly good insect,—and I was so fortunate as to bring away nearly a dozen of this beautiful species. Other captures were *Boarmia repandata*, *Acidalia ornata*, *Anaitis plagiata* and *C. paludata*. Our return lay along the embankment I have just referred to. The sun had brightened out, and, flying over the flowers, we again saw one of those mysterious yellow insects which had baffled us in the morning. Unmistakably it was a butterfly. Our three nets were at once in operation, and finally the insect fell to Mr. Murray. It was a fresh and perfect *Colias hyale*. Here, also, the idea prevailed that the season would be famous for an appearance in force of *Colias edusa*. It has, since my visit, been verified to some extent by several captures of the butterfly. Another common visitor has been *Sphinx convolvuli*.

Morecambe was, as usual, full of visitors. A great attraction there is the Winter Palace, on the balcony of which, high up, is a large electric lamp. Noticing, one evening, a large number of moths about this lamp, I got permission to take as many as I could. I therefore took up a position on the balcony,—with a glass partition separating me from the crash of the band, and with the sea stretching away into the darkness in front. To the surprise of many observers, of all ages and both sexes, who

evidently looked upon my evolutions with doubt, I took a representative number of insects. They were, however, only *Acidalia dimidiata* (scutulata), *Xylophasia monoglypha* (polyodon), *Triphaena pronuba*, and, of course, *Plusia gamma*.

After my return to Chester, and a rest of a day or two, I started again, on August 5th, for Welsh ground. I had accepted a kind invitation from Mr. W. J. Kerr, of Tan-y-Bwlch, Merioneth, to become his guest for a few days. Tan-y-Bwlch (which, in order to satisfy the legitimate curiosity of English readers, I will say is pronounced like Tan-e-Bulk) is situated midway, with a distance of something like ten miles on either side, as the crow flies, between Snowdon on the north and the classical Harlech on the south, and about the same number of miles from the sea. The locality is a well-wooded and lovely vale, shut in by lofty slate or limestone mountains. I arrived *via* Llangollen and Bala, on the 5th, in a severe thunderstorm. "After a storm cometh a calm," which, at least, must always be relatively true, so, although the evening was still wet, my host—who had previously sent a man to sugar some well-known trees—and I turned out after insects. Our rendezvous was a sloping bank, just inside an oak wood, and covered with heath and other plants in full bloom. The weather did not prevent us taking *Cidaria prunata* (ribesaria), *Noctua xanthographa* (the red form), and the ubiquitous *P. gamma*, at the heath blossoms. At sugar, however, we were only favoured with visits from *X. monoglypha*.

The next day showed the weather had not materially improved. In spite of almost continuous rain I hunted round the sheltered faces of the rocks near. The only insect I met with was the solitary wasp, *Odynerus spinipes*,—commonly enough,—but in every case hidden away in its mud cells from the tempestuous weather. Empty cocoons of *Bombyx quercus*, and of a gregarious member of the Zygenidæ, completed what, under favourable weather, would have been a long list from rock-hunting. Sugar, in the evening, was again a failure, except for the usual visits of *X. monoglypha*.

On the 7th rain fell in the first half of the day. The sun broke out in the afternoon, when I was taken to the borders of one of the numerous oak woods to see *Thecla quercus*, *Argynnis adippe*, and *A. paphia* on the wing. On a bank open to the sun, but sheltered by oaks, and covered with fern, flowers and bramble, the two last-named insects were to be seen in plenty feeding on the flowers of knapweed (*Centaurea nigra*), and sailing up to rest again on the oaks above. I netted a few, but they were all more or less damaged by the stormy weather. *T. quercus* was in tantalizing scores, but not one could we coax within reach. A splendid specimen rose one day from the muddy road, but I missed it. Our captures this day included *Eugonia erosaria*,—

one specimen drying its wings on a grass stem; *Phytometra viridaria* (*ænea*); *Larentia olivata*, a very common insect, and obtained by beating; *B. repandata*, and the lovely black-and-white *Ennychia octomaculata*. I was puzzled here, at first, with the local form of *B. repandata*. I had just seen the darker, well-marked Delamere form, and the still darker indistinct species of Westmoreland and North Lancashire; but this approached more in appearance the light markings of the Buckinghamshire *Tephrosia crepuscularia*.

The following day was as fine and sunny as could be desired. Mr. Kerr and I set off, after breakfast, for a tramp through the mountains in the direction of Harlech, on the coast. On the hills in August is not the best time for Lepidoptera; but we came across an occasional *Lycena icarus*, and the irrepressible *P. gamma*, whose pretentious flight made us wish the pursuit it beguiled us into—the hot sun—had been directed in a better cause. *Aphomia sociella*, *Crambus tristellus*, *C. margaritellus* in ivory and gold, and *C. inquinatellus*, we were able to add to our list of Micros. Two mountain lakes—Upper and Lower Tecwyn—we now passed. The waters of both were as clear as crystal, delicious and refreshing. On the banks of the Upper Lake—that nearest the sea—we halted a few minutes to look at the interesting scene. Around us the auriferous rocks had been disturbed in various places in the late “discoveries” of gold. Many of the stones lying about—in fact, most of them—showed traces of the precious metal, but only as if a brush had lightly touched them with the thinnest possible solution. The workings were therefore deserted. This lake lay in a mountain gorge, at the end of which, through a V-shaped opening just above the lake, we could see, in the clear perspective, the blue waters of Cardigan Bay. Around us rose cliffs to a dizzy height, and, against one of these, sailed a solitary cormorant—the only exception in this picture of still life. Shortly after we were once more in the lowlands, and following the well-shaded line of a clear trout-stream, by which we lunched, in the direction of Harlech Castle. All along we met with *A. adippe*, *A. paphia*, *Hesperia sylvanus*, and, in addition, a few very worn specimens of *A. aglaia*. *T. quercus* was again in plenty, high up around the oaks, whilst *Pararge megæra* and *Satyrus semele* winged their way over humbler haunts nearer ground. And so, through “these delightful pleasant groves,” we arrived, after some fifteen miles of tough tramp, at the estuary of the unpronounceable river which flows into the head of Cardigan Bay. This estuary is guarded by an embankment which is a well-known haunt of *Colias edusa* and *C. hyale*, but it was now too late in the day, and we saw none. We therefore crossed by the railway-bridge to the hotel at Mynyfford Junction. Here, according to arrangement, we were met by a groom, and we were soon trotting back, in time for dinner, along

a splendid road, and as fast as a well-appointed trap and thoroughbred could reasonably take us.

Our valuable auxiliary at sugaring, an elderly servitor, had been once again busy with the brush on some trees by a willowed stream, and so we turned out, after dark, to see what sport awaited us. To his quiet disgust there was nothing but a few bat-like *Mania maura* and the intrepid *X. monoglypha*.

I have often seen Snowdon, and stood on its summit, but I never had such a grand, clear view of the noble mountain as we enjoyed that day. This fact, with a sudden fall of the mercury in the evening, prepared us for another break in the weather next day. In the afternoon it cleared up, when, near the famous Black Falls, I beat, from oak and birch, larvæ of *D. falcataria*, *Cymatophora* or, *Notodonta chaonia*, *N. trimacula* v. *dodonea*, and *Amphidasys strataria* (*prodromaria*).

I will now quote, from Mr. Kerr's private collection, a few representative insects, which will show the rich entomological character of this neighbourhood:—*Argynnis selene*, *A. euphrosyne*, *Melitæa aurinea*, *Lycæna ægon*, *Nemeobius lucina*, *Sphinx convolvuli* (a series of over a dozen taken this September at flowers of *Nicotiana affinis*, specially grown for the purpose), *Chærocampa celerio* (one fine specimen, which flew into the house), *C. porcellus* (a long series netted at honeysuckle bloom), *C. elpenor* (a long series taken at rhododendron flowers on the lawn), *Macroglossa bombyliiformis* (another long series, netted also, if I remember rightly, at the same flowers), *Sesia myopiiformis*, *Ino statice*, *N. russula* (a beautiful variety of *Arctia caia*, in which the colours were substituted for each other), *Pterostoma palpina*, *Thyatira derasa*, *T. batis*, *Acronycta leporina*, *A. ligustri*, *Agrotis ashworthii* (unidentified, I think, until I saw it), *Plusia interrogationis*, *Hydrelia unca* (a common insect), *Euclidia glyphica*, *Brephos parthenias*, *Angerona prunaria* (common), and *Melanthia albicillata* (also common).

The following day, August 10th, was a wet one, and ended a most enjoyable visit. I started for home, and my kind host for the moors.

2, George Street, Chester, October 28, 1889.

ENTOMOLOGY OF ICELAND: NOTES UPON A VISIT IN 1889.

BY THE REV. F. A. WALKER, D.D., F.L.S., &c.

(Concluded from p. 275.)

LIST OF INSECTS TAKEN IN ICELAND.

Coleoptera.

Otiorhynchus. Abundant. Reykjavik, Flatey Island, Isafjord, Saudakrok, Stykkisholm, Arnafjord, Reykfjard, and elsewhere.

Creophilus maxillosus. Reykjavik (lane in outskirts of Reykjavik, above cjohn or the lake in rear of the cathedral). Akureyri.

Platysna (Pterostichus) vitreum. Reykjavik, Stykkisholm, Isafjord, Akureyri, Patreksfjord, Reykjafjord, and from other fjords.

Colymbetes. Reykjavik (under stones by margin of lake, about a mile west of Reykjavik).

Calathus melanocephalus. Reykjavik, Flatey Island, Patreksfjord, Saudakrok, and from other fjords.

Amara. Reykjavik, Saudakrok, and from other fjords.

Nebria brevicollis. Reykjavik, Stykkisholm, Akureyri, Seydisfjord, and from other fjords.

Bradycellus. Saudakrok.

Elater, near *Cryptohypnus*. One. Isafjord.

Byrrhus. Reykjofjord, Eskefjord.

Staphylinus, *Philonthus*, or *Quedius*. One. Reykjafjord.

Chrysomela staphylea. One. Akureyri.

Elaterida. From one of the fjords.

Notiophilus. From one of the fjords.

Aphodius. Reykjavik.

Almost all the Coleoptera above mentioned were found under stones, with the exception of *Creophilus maxillosus* and *Byrrhus* taken flying.

Lepidoptera.

Crymodes cralis. Reykjavik, Thingvellir. Common. One specimen of very dark type, Krisuvik.

Agrotis cursoria. Four. Akureyri.

Agrotis? Possibly new. Akureyri and Dyrafjord.

Plusia gamma. Reykjavik.

P. interrogationis (two specimens). Thingvellir.

Noctua confusa. Reykjavik, Thingvellir. Abundant. Markings of forewings very variable.

Chareax graminis. Reykjavik, Hafnafjord, Patreksfjord.

Hadena akureyriensis, suggestive of *pisi*.

Larentia cesiata. Very abundant. Thingvellir.

Cyrmia manitata. Reykjavik, Thingvellir. Very abundant. Markings of forewings very variable.

C. propequata, var. *vatnsmyriensis*? Vatnsmyri Moor. Reykjavik.

C. truncta (russata). Reykjavik, Arnesfjord, Dyrafjord, Onundafjord.

C. russata, var. *gornensis*. Meadows by cjohn (or lake) in rear of cathedral. Reykjavik.

C. immanata. Abundant. Reykjavik, Arnesfjord, Dyrafjord, Onundafjord, Isafjord.

C. marmorata. Abundant. Reykjavik, Arnesfjord, Dyrafjord, Onundafjord, Isafjord, Akureyri, Eskefjord.

Pempelia fusca. Common. Thingvellir.

Apkelia osseana. Abundant. Thingvellir, Engay.

Trichoptera.

Limnephilus piceus. Also common. Very prettily marked. Reykjavik, Thingvellir, Seydisfjord, Isafjord, Engay.

L. griseus. The commonest species and subject to variation in size and marking. Reykjavik, Thingvellir, Siglufjörður, Eskefjörður, Ofjörður (or Akureyri), Isafjörður, Engey.

Grammotaulius atomarius. One specimen. Reykjavik.

Hymenoptera.

Bombus hortorum. Reykjavik, Thingvellir, Eskefjörður.

Ichneumon albicinctus (female). Engey.

Pimpla sodalis. Thingvellir.

P. sodalis? (possibly female).

Diptera.

Helophilus pendulus. Reykjavik, Engey, Thingvellir, Eskefjörður.

Scatophaga stercoraria. Reykjavik, Thingvellir, *et passim*.

Culex pipiens. Reykjavik Hotel, Reykjavik, Thingvellir.

Homalomyia canicularis. Akureyri.

Calliphora erythrocephala. Reykjavik, Engey, Thingvellir, Hafnafjörður, Krisuvík, Reykafjörður, Akureyri, Vopnafjörður, *et passim*.

C. greenlandica. Reykjavik, Hafnafjörður, Krisuvík, Akureyri, Vopnafjörður.

C. vomitoria. Generally common.

Sarcophaga mortuorum. Reykjavik, Hafnafjörður, Krisuvík, Saudakrokur, Siglufjörður, Akureyri, Vopnafjörður, Seydisfjörður, Eskefjörður.

Scæva pyrastræ (black var.). Akureyri.

Simulia reptans. Near Geysir.

Musca azurea. Akureyri.

M. domestica. Reykjavik, &c.

Sphærophoria scripta. Thingvellir.

Drymeia hamata. Thingvellir.

Syrphus nitidulus. Thingvellir.

S. ribesii. Thingvellir.

S. arcuatus. Thingvellir.

Platychirus albimanus. Thingvellir, Reykjavik.

Limnophila arctica. Thingvellir.

L. arctica var. *fuscipennis* near (unless n. sp.). Thingvellir.

The *Otiorhynchus* above-mentioned among the Coleoptera, should be divided into two species, of which *O. monticola* is by far the commonest, being widely distributed, and occurring at nearly every fjörður. *O. maurus* is met with at Reykjavik and Thingvellir.

The *Nebria brevicollis* above recorded should by rights be *Nebria gyllenhali*, the same species as Staudinger mentions having found in Iceland. *Nebria gyllenhali* is smaller than *N. brevicollis*, which latter species I captured at Thorshavn, Faroe Isles.

I found *Calathus melanocephalus* at Reykjavik to consist mostly of Staudinger's var. *nubigena* with the black or blackish thorax, very few of the typical form with the red thorax. The

Flatey Island ones are black, so too those from Thingvellir, and those from Onundafjord. The specimen from Patreksfjord is intermediate, the Saudakrok one has the typical red thorax.

Some of the specimens of *Pterostichus* are brownish, others jet black; but the difference in colouring does not constitute them two species.

I am indebted to Messrs. South, Kirby, and Mason for assistance in identifying some of the more obscure of my captures.


Dun Mallard, Cricklewood, N.W.

CONTRIBUTIONS TOWARDS A LIST OF THE VARIETIES OF NOCTUÆ OCCURRING IN THE BRITISH ISLANDS.




By J. W. TUTT, F.E.S.

(Continued from p. 278.)


Apamea, Och., *gemina*, Hb.


The type of this species is represented by Hübner's fig. 482, of which I made the following description:—"Anterior wings blackish grey, with a pale basal line; stigmata faintly outlined, and followed by a pale transverse line, a row of white dots, and a pale toothed line. Posterior wings dark grey, with paler base and dark lunule." Dr. Staudinger writes of the type, "forma obscura magis." This particular form is the one represented in Newman's 'British Moths,' fig. 2, p. 304. It will be seen that very few of our British specimens would answer to the above description, which represents quite a melanic form of the more mottled type. Our specimens of this latter form are generally brownish grey or brown, although I have specimens, taken by the Aberdeen collectors, and others taken by Mr. Percy Russ of Sligo, and Mr. Newman of Darlington, which are either altogether greyish black or otherwise very dark, and closely resemble the type. The species is variable within certain limits, and extends from the more unicolorous type in blackish grey and brownish, through specimens of the same coloration, but with a distinct line under the stigmata, to an extreme variety with all the median space and costal area very dark, and the outer and inner margins pale grey, and bearing a strong superficial resemblance to *Hadena genista* in some specimens. The first (mottled) form follows the group,* of which I consider *basilinea* the type, having the short longitudinal basal line and paler transverse lines; the latter (dark central area) forms an extreme development, which I consider typical* in *pabulatricula*, having the development of the dark -like mark under the


* Vide introductory notes to genus *Apamea*.


stigmata, and the central area banded, although there is a complete gradation of intermediate forms. There would thus appear to be two varieties in the unicolorous form,—(1) grey, inclining to blackish, with no brown or very little brown; (2) grey, much suffused with brown, and sometimes entirely reddish brown. In both of these, differences in intensity of colour, and in the development of the tranverse lines, occur. The form most closely allied to these is that in which the dark -like mark* is developed under the stigmata (var. *intermedia*), and as the space above is generally shaded it gives the specimens a rather banded appearance, as in Newman's 'British Moths,' p. 304, fig. 1, although generally more strongly marked. Of this variety there are two shades of colour, grey and reddish brown. Var. *intermedia* is distinctly intermediate between the type and the next (var. *remissa*, Hb.), where the black -like mark is extended into a large blackish or brownish patch, extending upwards to the costa between the reniform and orbicular, and connected with another dark patch developed between the two short, longitudinal, basal streaks, and with the space outside the subterminal line of the same dark shade, especially in its central area and at the anal angle; the inner margin of the wing very clear, and almost immaculate. This extreme form is apparently the *remissa* of Hübner and of Treitschke. Of this variety Staudinger writes, "dilutior, variegata." Var. *remissa*, Tr., and var. *intermedia* appear to be united by Guenée to form his var. A, "*La Brouillée*" of Engramelle ('Noctuelles,' vol. v., p. 208), of the general variation of which Guenée writes:—"It is possible that this may be distinct from *gemina*." "This *Apamea* differs from *didyma* by its generally darker colour, its anterior wings generally a little narrower, and above all by a black streak which unites the two transverse lines below the submedian nervure, leaving between this line and the inner margin a space generally paler than the ground colour. Certain subvarieties have all the subterminal space equally clear, and thus somewhat resemble *Hadena genistæ*. These are known in collections as *submissa*." This latter is a very rare development, and appears to be the *remissa* of Hübner, a slightly more extreme development of the *remissa* of Treitschke. The only very extreme specimen I have, in a very long series, came from Mr. Finlay, of Morpeth. The *remissa* of Haworth ('Lepidoptera Britannica,' p. 189, No. 79) is apparently the same as *remissa*, Tr., to which many of our British specimens are referable, while the var. β of his *remissa* appears to refer to Hübner's rather more extreme form. The *oblonga* of Haworth is simply a slight modification of var. *intermedia*, being a grey form with the costal area, containing the grey stigmata, brownish, the -mark developed, the subterminal line whitish; the dark fuscous type


Haworth calls *obscura*. Mr. Porritt writes, concerning the general variation of this species,—“The pale variegated variety, as well as the dark forms, occur at Huddersfield” (*in litt.*); and Mr. Gregson, ‘Entomologist,’ vol. iv., p. 52, writes, “This does not vary so much here (Liverpool) as in the South (of England). My best varieties of it were given to me by Mr. Doubleday. One is a very *genistæ*-like specimen.” Mr. W. Reid, of Pitcaple (Aberdeen), writing of the Scotch specimens, says:—“The type, together with var. *rufescens* and var. *intermedia* (both *-grisea* and *-rufa*), are all to be obtained in more or less abundance in this district. I once captured a very fine var. *remissa*, which agreed well with Guenée’s description. It had a very light ground colour, with distinct, dark—almost black—markings. It bore a very strong superficial resemblance to *H. genistæ*” (*in litt.*). Tabulating the principal varieties we get:—

1. A dark greyish black mottled form, without the -like mark, = *gemina*, Hb.



2. A reddish or brownish grey mottled form, without the -like mark, = var. *rufescens*.

3. A grey form, with an -like mark under stigmata, = var. *intermedia-grisea*.

4. A reddish or brownish grey form, with an -like mark under stigmata, = var. *intermedia-rufa*.

5. A grey form, with dark blotch between stigmata from -like mark to costa, dark outer margin, = var. *remissa*, Hb.

a. var. rufescens, mihi.—Ground colour reddish or brownish grey, with the transverse lines as in the darker type. As in the type, there is no special development of the claviform or of the darker central area, which become so noticeable in the following varieties. Many of the specimens belonging to the mottled form, taken in the South of England, have a more or less reddish or brownish ground colour. I believe this variety occurs in most localities in all parts of the British Islands where var. *intermedia* and var. *remissa* occur.

β. var. intermedia, mihi.—Under the head of *intermedia* we get two subvarieties; one grey in colour, the other reddish brown. These I have called:—(1) *intermedia-grisea*.—Ground colour grey or greyish brown, with the claviform developed into an -like mark, which joins the median transverse lines, the space between the stigmata being darker than the ground colour, and thus having a somewhat banded appearance. (2). *intermedia-rufa*.—This is like *intermedia-grisea*, but has the ground colour brownish or reddish grey, with the same characteristic markings as in that variety. This would appear to be the “*La Brouillée*” of Engramelle. Guenée writes of it:—“It is distinguished above all by a black mark, which unites the two median transverse lines above the submedian nervure, leaving between it and the internal border (*i. e.*, below the -like mark) a space generally paler than the ground colour” (‘*Noctuelles*,’ vol. v., p. 208). These varieties appear to occur in almost all parts of the British Isles. I have them from Sligo, from Aberdeen, and many other Scotch and English localities.

γ. var. *oblonga*, Haw.—Haworth describes a variety of *gemina* under the name of *oblonga*, treating it as a distinct species. He writes:—"Alis cinereis nebulosis, costa maculâquæ oblongâ fuscis, strigâque albâ posticâ undulatissimâ." "Alæ anticæ longitudinaliter semifuscæ, in quâ parte puncta costalia, apex, et stigmata ordinaria, cinerascencia. Altera pars alæ etiam cinerascit, maculâ majusculâ posticâ cuneiformi fuscâ, et aliâ in medio oblongâ marginem tenuiorem versus. Alæ posticæ albicantes, fimbriâ fuscâ; cætera ut in variis sequentibus" ('*Lepidoptera Britannica*,' pp. 188, 189). This is very little different to some forms of *intermedia*, but seems to have a darker costal area, in which are situated the paler stigmata.

δ. var. *remissa*, Hb.—About the synonymy of this variety there seems to have been some doubt, although Hübner, Haworth, and Treitschke appear to have described rather more or less extreme forms of the same variety under the same name. Dr. Staudinger, however, calls the variety *remissa*, Tr. (why Treitschke I do not know, except that Hübner's rather more extreme form is more rarely obtained), and says of it, "dilutior, variegata." Hübner's figure 423 may be described as having "a pale basal patch, with two short black basal streaks, while the transverse basal line is followed by a large blackish patch extending from the costa, not quite to the inner margin, in which is placed the pale orbicular and the inner half of the pale reniform; the inner margin and space beyond the reniform is pale, with a paler line parallel to the hind margin. Hind wings grey, with the base paler." Haworth's *remissa* is described much in the same way. He writes:—"Alis pallide fuscescentibus nebulosis, lineolis duabus basi, arcuque medio, crassissimo nigricantibus." "Præcedenti (*oblonga*) affinis costâ pallidior strigâque posticâ minus dentatâ, et fere evanescente; maculâ oblongâ nigrâ superne altè fusco adnatâ et inde stigmata subcinerea arcuatim includente. Posticæ alæ fuscescentes." He also adds that there is a form of this variety, "characteribus pallidioribus, at magis distinctis" ('*Lepidoptera Britannica*,' p. 189, No. 79). Guenée writes of Hübner's *remissa*:—"Superior wings a little more rounded, having the subterminal space, the two ordinary stigmata, a part of the basal space, the inner margin, and an apical patch of a pale greyish ochreous colour, which contrasts very strongly with the almost black colour of the median space." Guenée only gives "North America" as a locality for this variety, but adds directly after:—"I have not seen an example agreeing exactly with Hübner's figure; our European specimens agree more or less with the var. A (*i. e.*, var. *intermedia*), of which this variety is only an extreme form. It is, therefore, very possible that it occurs with us, and very probably the specimen which served as Hübner's type was not exotic" ('*Noctuelles*,' vol. v., p. 208). This variety in its extreme form is not common in Britain, but at the same time it is not very rare, and I should most certainly consider Hübner's type an European one. The greater number of our specimens are referable either to the type var. *rufescens* or var. *intermedia*.

(To be continued.)

ENTOMOLOGICAL NOTES, CAPTURES, &c.

THE LATE FREDERICK BOND.—I have read with much interest the memoir of our dear old friend, in your magazine of this month, so ably written by Mr. J. W. Dunning. Being probably one, if not the oldest of his entomological friends, a few recollections of him in our early days may not be out of place as a supplement. I made the acquaintance of Frederick Bond at the natural history sales that took place at the Auction Rooms, King Street, Covent Garden, just fifty years ago, and he kindly invited me down to Mount Pleasant, Kingsbury, where he was residing with his step-father, Capt. Bond. I was a frequent visitor after that, generally staying from Saturday to Monday, and used to enjoy my visits very much. We took occasionally little entomological excursions together, in the neighbourhood and elsewhere. At that time he might be called a general lover and collector of all natural history subjects. Nothing came amiss to him in animal life; but his greatest interest was shown for birds and beetles, foreign as well as British. Frequently we used to meet by appointment on Hampstead Heath, to search after *Pæcilus dimidiatus*, which was then not uncommon there, and to the lane where the beautiful *Tychius 5-punctatus* was discovered on vetch by our old friend Frederick Smith. My collecting British Lepidoptera induced him to take that order up, and a series of *Colias hyale* which I gave him in 1842, specimens captured by me near Arundel that year, encouraged him to go on, and resulted in his getting together one of the finest collections of British Lepidoptera in this country, his collection, like my own, being very rich in varieties. I always found him a kind and genial companion, and ever ready to impart information, and shall remember with pleasure to the end of my days the many delightful hours that I spent in his society.—SAMUEL STEVENS; Loanda, Beulah Hill, Upper Norwood, Nov. 2, 1889.

VANESSA ANTIOPA IN HANTS.—While sketching on Friday, November 8th, which happened to be a peculiarly warm day for the time of year, I saw a *Vanessa antiopa*. It flew quite close to me, almost into my face, and I had no doubt of its identity, though I made no attempt to catch it.—L. F. MARINDIN; Liss, Hants.

EPINEPHELE TITHONUS, var.—While staying at Perranporth, on the north coast of Cornwall, the last week in August, I caught a variety of *Epinephele tithonus*, which has, under the large black spot in the corners of the upper wings, two smaller ones. It is a female specimen, and, I am sorry to say, rather damaged.—H. J. DIXON; 7, Leamington Park Villas, Acton, October 21, 1889.

DEILEPHILA GALII, PARASITES ON.—On reading the paragraph from the Rev. Mr. Bloomfield (Entom. 280), I placed myself in communication with the author, also with J. B. Bridgman, and having compared notes and insects, have arrived at the conclusion that the parasite is *Trogus exaltorius*, Panz., and not *T. lutorius* as was intended. I hope to refer to the difference between *T. exaltorius* and *T. lutorius* in the next volume.—G. C. BIGNELL; Stonehouse, November 20, 1889.

THYATIRA BATIS VAR. MEXICANA, Hy. Edw.—In looking over some vols. of '*Papilio*,' I came across (vol. iv, Jan. 1884, pp. 16, 17), the description of a new variety of *T. batis* named as above, which I quote, as it is

omitted from Mr. Tutt's valuable paper (Entom. xxi. p. 46), and is presumably unknown to British lepidopterists. It "differs from the European form by its larger size, much darker ground-colour of the wings, both primaries and secondaries, and by the pinkish spots having a larger and darker internal shade. The ground-colour of the primaries is rich dark olive-brown; the secondaries the same colour, with fainter median band, and a little lighter shade at the base. Exp. wings 44 mm." This moth was taken in Mexico by Mr. Wm. Schaus, Jr.—T. D. A. COCKERELL; January 8th, 1889.

HELIOPHOBUS HISPIDUS.—I have just most carefully looked through a series of *Heliophobus hispidus*, consisting of thirty-two specimens. Of these, twenty specimens have been captured in Portland during the last sixteen months; the remaining twelve were captured near Torquay some twelve months earlier. They are all in fine condition and very perfect. In them there is not the slightest trace of a violet tinge, and Hübner's figure is characterised by a strong violet colour. Would Mr. South suggest that the "tinge of slaty grey," mentioned by Mr. N. M. Richardson (Entom. 136), is the violet of Hübner's figure? Mr. Richardson, who has (I believe) taken very considerable numbers of this species, cannot see any trace of violet in the Portland specimens. Major Partridge and Lieutenant Brown have, I believe, never taken "violet-coloured" examples. Mr. Tutt asserts that the species at Portland is not like Hübner's figure, and I agree with him; and yet Mr. South judges from the same specimens and finds such a colour. There is, of course, an explanation, *viz.*, that Mr. Richardson has caught this year what he could never get before, *i.e.*, violet-coloured specimens; and if so, it would be most interesting for Mr. Richardson to tell us about them.—WILFRED CARRICK; 67, Avondale Square, Old Kent Road, London S.E., November 5, 1889.

PARASITES ON MOTHS.—From the recent notices on this subject (Entom. 237, 262, 263), these occurrences would appear to have been more than usually frequent during the present season; and it may be worth while to record two further instances which have been brought under my notice by Mr. Ernest W. H. Blagg, of Cheadle, Staffordshire. In September last, he kindly submitted to me two specimens, *Caradrina quadripuncta*, and *Amphipyra tragopogonis*, taken by him at sugar, the wings of which were quite reddened by the presence of numerous Acari with which they were covered, and which proved upon examination to be mature specimens of *Cheyletus venustissimus* (Koch). As the Cheyleti are predatory Acari and apt to fall foul of one another whenever occasion offers, the reason for their thus congregating in such close quarters would form an interesting subject for investigation. Does *C. quadripuncta* pupate in localities where Cheyleti generally abound, such as granaries, stables or chaff-houses; and in what way and at what time is it likely to become infested by these Acari? It is a somewhat singular circumstance that the Cheyleti appear to be attached by the anal orifice to the scales upon the moths' wings, thus remaining fixed firmly, although all the legs are free.—E. BOSTOCK; Stone, Staffordshire, October 23, 1889.

SUGAR UNPRODUCTIVE.—I would like to state, with regard to Mr. Stott's suggestion (Entom. 262) as to the excess of honeydew secreted, and not the sudden fall of temperature at sunset alluded to, being the cause of the

unproductiveness of sugar this season, that during the greater part of the time to which I referred I was working on the Downs at an elevation of about 500 feet, where the vegetation was necessarily stunted and the absence of trees complete. Not only was there the marked absence of moths upon sugar and blossoms, but very little was to be seen on the wing. At the same time I have no doubt that those working in woods and ordinary collecting-ground find the honeydew every year, until washed off by heavy rain, an important factor in their non-success in working sugar or flowers.—ALBERT J. HODGES; 2, Highbury Place, London, N.

NEW VIEWS ON THE SUBORDER HOMOPTERA.—In the 'Entomologist' (p. 269), Mr. G. B. Buckton has contributed his views as to a new classification of the Homoptera, which he calls "Cicadæ." In the course of his remarks he writes:—"And quite lately, Mr. W. L. Distant has divided the Indian Cicadidæ he describes into two groups, which practically separates the singing, from the silent genera. The insects comprised in the latter division must be numerous in the temperate regions of the Himalayas; but to them he does not appear yet to have given a name." Mr. Buckton is mistaken: in my monograph of the Indian Cicadidæ (a family of Homoptera, not the suborder, which Mr. Buckton apparently considers as the same thing), I have divided that family into two groups, separable by the tympana in the males being more or less entirely covered or exposed. I know of no "silent" Cicadidæ. Of the other families of Homoptera, to which Mr. Buckton says I do not appear to have yet given a name, I can only say:—Firstly, I do not deal with them in my monograph; and, secondly, if I did, those families are not in want of new names. A reference to Professor Westwood's 'Modern Classification of Insects,' or to the writings of Puton, Stal, Berg, or other modern authorities on the Homoptera (even including Walker, whom he mentions as a supporter of his own views), would materially assist Mr. Buckton with the suborder of which he has a monograph in preparation.—W. L. DISTANT.

FUNGUS PARASITIC ON INSECTS.—Referring to my note and the editor's remarks on this insect (Entom. xxii. 284), I have received a second letter from my son, giving the following further details:—"The specimens I sent you are rare. They were obtained on the top of one of the spurs leading from the gorge of the Otaki River to the principal ridge of mountains previously mentioned, near Kapiti Island, and were buried perpendicularly in ordinary soil, about one inch below the surface, beneath the overhanging branches of a Rata-tree, — a gigantic vine as large as a full-sized English elm." On perusing Dr. White's instructive article on "Parasitic Fungi" (Ent. xi. 121, 1878), I notice that the allied British species (*Isaria farinosa*) attacks the body of the larva in several parts, whereas the New Zealand species does so, apparently, only in its extremities. I am not aware of any advance in the study of the habits of the latter fungus since Dr. White's article was written, which would unravel the mystery connected with this parasite's *modus operandi* in attacking its victim; and should such not exist, any information on this and kindred points would no doubt be not only highly instructive, but of much scientific value. It is therefore to be hoped that some earnest worker in this branch of natural history may be enabled to investigate the matter to a successful issue.—GEO. J. GRAPES; Berkeley Villa, 34, Charlwood Road, Putney, S.W., November 5, 1889.

ERRATUM.—Page 236, line 30, for "Expallidana" read "parvulana."

SOCIETIES.

ENTOMOLOGICAL SOCIETY OF LONDON. — November 6th, 1889.—Prof. J. O. Westwood, M.A., F.L.S., Hon. Life-President, in the chair. Mr. Richard S. Standen, of Framlingham Earl Hall, Norwich, was elected a Fellow; and the Rev. C. F. Thornehill, M.A., was admitted into the Society. Mr. J. W. Douglas sent for exhibition specimens of *Anthocoris visci*, Dougl., a new species, taken from misletoe, at Hereford, in the end of September last, by Dr. T. A. Chapman; also specimens of *Psylla visci*, Curtis, taken by Dr. Chapman from misletoe, at the same time and place. Mr. R. M'Lachlan exhibited coloured drawings of a specimen of *Zygana filipendulæ*, in which the left posterior leg is replaced by a fully-developed wing, similar to an ordinary hind wing, and with the neurulation almost precisely the same, but less densely clothed with scales. The specimen was described by Mr. N. M. Richardson in the Ent. Mo. Mag. for June, 1889, and the drawing was executed by Mrs. Richardson. Mr. M'Lachlan also exhibited a female specimen of the common earwig, *Forficula auricularia*, with a parasitic Gordius emerging from between the metathorax and abdomen. He said that it had been placed in his hands by Mr. A. B. Farn, by whom it was taken, and that other instances of similar parasitism by Gordius on earwigs had been recorded. Mr. W. F. Kirby exhibited a gynandromorphous specimen of *Lycæna icarus*, having the characters of a male in the right wings and the characters of a female in the left wings, caught by Mr. T. Brown at Keyingham, Yorkshire, on the 22nd of June last: also a specimen of a variety of *Crabro interruptus*, De Geer, found by Mr. F. Woodbridge in a hole in a log at Uxbridge. Mr. W. L. Distant exhibited a male and female specimen of a species belonging to a new genus of *Discocephalina*, from Guatemala, in which the sexes were totally dissimilar, the female having abbreviated membranes, and being altogether larger than the male. Dr. D. Sharp stated that he had observed that in the *Ipsinæ* division of *Nitidulidæ* there was present a stridulating organ in a position in which he had not noticed it in any other Coleoptera—viz., on the summit of the back of the head. He had found it to exist not only in the species of *Ips* and *Cryptarcha*, but also in other genera of the subfamily; on the other hand, he could not find any trace of its existence, except in members of the *Ipsinæ*. He exhibited specimens of *Ips* and *Cryptarcha*, mounted to show the organ. Dr. Sharp also exhibited a box of *Rhynchota*, chiefly *Pentatomidæ*, in which the specimens were prepared so as to display the peculiarities of the terminal segment in the male sex. Mr. R. Adkin exhibited, on behalf of Mr. H. Murray, of Carnforth, a fine series of *Polia xanthomista*, var. *nigrocincta*, from the Isle of Man, and *Cidaria reticulata* and *Emmelesia taniata* from the Lake District. Mr. W. White exhibited a living larva of *Zeuzera æsculi*, and called attention to the chitinous scutum or thoracic segments with several rows of minute serrations, which evidently assist progression. He stated that the larva exudes from its mouth, when irritated, a colourless fluid, which he had tested with litmus-paper and found to be strongly alkaline. Prof. Westwood made some remarks on the subject. Capt. H. J. Elwes exhibited a number of insects of various orders, part of the collection formed by the late Otto Möller, of Darjeeling. Mons. A. Wailly exhibited the cocoon of an unknown species of *Antheræa* from Assam; also a number of cocoons and imagoes of *Anophe venata* from Acugua, near the Gold Coast, West

Africa; specimens of *Lasiocampa otus*, a South European species, which was said to have been utilized by the Romans in the manufacture of silk; also a quantity of nests containing the eggs of *Epeira madagascariensis*, a silk-producing spider from Madagascar, locally known by the name of "Halabe." He also read extracts from letters received from the Rev. P. Camboué, of Tananarivo, Madagascar, on the subject of this silk-producing spider. Mr. H. Goss read a communication received by him from Prof. S. H. Scudder, of Cambridge, Mass. U.S.A., on the subject of his recent discoveries of some thousands of fossil insects, chiefly Coleoptera, in Florissant, Western Colorado, and Wyoming. Prof. Westwood remarked on the extreme rarity of fossil Lepidoptera, and called attention to a recent paper by Mr. A. G. Butler, in the Proc. Zool. Soc., 1889, in which the author described a new genus of fossil moths belonging to the Geometrid family *Euschemidæ*, from a specimen obtained by Mr. A'Court Smith, at Gurnet Bay, Isle of Wight. Mr. F. P. Pascoe read a paper entitled "Additional Notes on the genus *Hilipus*," and exhibited a number of new species belonging to that genus. The Rev. Dr. Walker read a paper entitled "Notes on the Entomology of Iceland." Mr. Roland Trimen asked if any butterflies had been found in the island. Dr. Walker said that neither he nor Mr. P. B. Mason had seen any during their recent visit to Iceland, nor were any species given in Dr. Staudinger's list. In reply to a question by Mr. G. C. Champion, Mr. Mason said that during his recent visit to Iceland he had collected nearly a hundred species of insects, including about twenty Coleoptera. He added that several of the species he had taken had not been recorded either by Dr. Staudinger or Dr. Walker. Capt. Elwes enquired if Mr. J. J. Walker, with his great experience as a collector in all parts of the world, was aware of any land except Iceland, outside the Arctic Circle, from which no butterflies had been recorded. Mr. J. J. Walker replied that the only place in the world which he had visited, in which butterflies were entirely absent was Pitcairn Island.—H. Goss, *Hon. Secretary*.

THE SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.
—The Annual Exhibition was held at the Bridge House, London Bridge, S.E., on Wednesday and Thursday, the 30th and 31st of October. Besides the class Insecta, the exhibits comprised birds, birds' eggs and nests, fish, reptiles, Mollusca, and Crustacea; geological and botanical specimens; paintings, engravings, &c., of natural-history subjects. There was a good display of microscopic objects and apparatus, no less than thirty exhibitors showing in the room set apart for them. Among the principal exhibitors of Insecta were Mr. H. Burns, with nests of living British ants, taken, among other localities, from Lambeth and Conway Castle, the species being *Formica fusca*, *Lasius flavus* (with queen), *L. niger*; there was also a nest from Boulogne. Mr. R. M'Lachlan, with European Neuroptera, *Ascalaphus*, *Nemoptera*, and *Perlidae*; also specimens of Orthoptera from Burmah, *Megalodon ensifer*, Brullé. Mr. Eland Shaw also exhibited Orthoptera. Hymenoptera, Hemiptera, and Diptera were shown by Messrs. T. R. Billups, S. Robinson, and Miss M. Kimber, the latter an interesting case of *Sirex gigas* and *S. juvenis*, with lead piping, showing the ravages of the larvæ of these species. Mr. T. R. Billups put in his fine collection of British Coleoptera; Messrs. C. H. Goodman, W. West, and Rev. W. F. Johnson also exhibited in this order, the latter with rare and local Irish forms. The principal exhibitors among the Lepidoptera were

Mr. J. H. Leech, with nearly the whole of the known species of the Palaearctic Catocalidæ, one of the most attractive features of the Exhibition. Mr. Murray, series of *Polia xanthomista*, *Cidaria reticulata*, and dark forms of *Emmelesia taniata*, bred during the year. Mr. Austin, varieties of *Argynnis aglaia* and *Lycana icarus*; also series of *Angerona prunaria* and *Gnophos obscuraria*, both showing a wide range of variation. Mr. A. C. Vine, specimens of *Deilephila livornica*, *Chærocampa celerio*, *Coccyx scopariana*, *Lita leucomelanella*, and *Nepticula fulgens*, and an undetermined *Gelechia* bred from *Genista tinctoria*. Mr. R. Adkin, Rhopalocera from his collection, together with long and variable series of *Pieris napi*, *Lycana icarus*, *Epunda lutulenta*, and many other species, taken in the north of Ireland and North Wales; also a long series of *Acidalia marginepunctata* from Sussex, showing great variation. Mr. J. R. Wellman, four drawers from his collection, including Sesiidæ, and fine and variable series of the *Acidalia* and *Eupithecia*. Mr. J. A. Clark, a series of cases illustrating the life-history of *Cossus ligniperda*, with sections of various trees, showing the destructive powers of the larvæ. Mr. G. Elisha, the whole of his collection of the British Tineæ. Mr. G. J. Grapes, larvæ of *Hepialus virescens* from New Zealand, attacked by fungi. Mr. Machin, Bombyces, amongst which were a fine variety of *Bombyx trifolii* and a series of *Lasiocampa ilicifolia*, full series of the *Drepanulidæ*, *Dicranura bicuspis*, and black specimens of *Stauropus fagi*. Mr. Schooling, yellow specimens of *Zygana filipendulæ*, and varieties of *Triphæna fimbria*. Mr. R. South, British Tortrices, comprising, amongst others, long and variable series of *Leptogramma literana*, *Peronea cristana*, *P. hastiana*, and *Teras contaminana*. Mr. C. B. Smith, *Eugonia autumnaria*, taken this year. Mr. Vaughan, fine varieties of Rhopalocera and of *Arctia caia*. Mr. Tutt, series of all the British species of the genus *Xanthia*, arranged to show the extreme intermediate forms of variation; also a very complete collection of the British Pterophori, giving locality and dates of capture. Mr. Barren, *Argynnis paphia* and var. *valexina*, with intermediate forms. Mr. Adye, several of the rarer Sphinxes. Mr. West, of Greenwich, two drawers of British Tortrices, containing the Tortricidæ and Penthinidæ. Mr. Tugwell, striking varieties of the Geometridæ; bred specimens of *Boletobia fuliginaria*, with cocoon, from Bankside, Rotherhithe; long series of *Deilephila galii*, varieties of *Arctia mendica*, *A. menthastri*, and *A. lubricipeda* from English, Scotch, and Irish localities. Mr. C. A. Briggs, Scopariidæ from Hebrides, Orkneys, Shetlands, Ireland, Wales, Scilly Isles, &c. Mr. A. J. Croker, life-histories of British species and varieties of Lycenidæ. Mr. Albuary, varieties of many species. Exotic Lepidoptera were shown by Mr. Jenner Weir. Mr. W. Dannatt, Ornithoptera from the East Indies and Malay Islands, &c. Mr. S. Edwards, Papilionidæ from India, North and South America, &c. Mr. A. H. Jones, European Papilionidæ, Pieridæ, and Apaturidæ. Mrs. Hutchinson, Miss Adkin, Miss Billups, and Messrs. H. A. Auld, O. C. Goldthwaite, T. W. Hall, J. Jäger, E. C. Joy, C. Levett, B. L. Nussey, C. Oldham, C. H. Williams, G. B. Ashmead, H. T. Dobson, and many others assisted by exhibiting. During each evening, Mr. G. Day delivered two short lectures, which were illustrated by the Triplexicon lantern; and there was a table set apart for the display of fungi by the Exhibition Committee, assisted by Mr. Step. This Exhibition is the most successful that the Society has given; during the two evenings on which it was open, close upon 2000 visitors having gone through the various rooms.

October 24th, 1889.—T. R. Billups, Esq., F.E.S., President, in the chair. Messrs. W. Mansbridge, V. Gerrard, C. H. Collings, H. C. Pickard-Cambridge, J. T. Winkworth were elected full members; and Messrs. C. J. Wainwright and A. Ford as country members. Mr. Wellman exhibited series of the second brood of *Acidalia marginepunctata*. Mr. R. Adkin, specimens of *Retinea resinella*, with pupæ and cocoons, and read notes on the life-history of the species. Mr. W. West, *Gordius aquaticus*, and contributed notes. Other exhibits were made by Messrs. Tugwell, J. J. Weir, Ince, Adye, Moore, Fremlin, Auld, Mera, Manger, and by Mr. Billups, on behalf of the Rev. W. F. Johnson and Mr. G. J. Grapes. —H. W. BARKER, *Hon. Sec.*

REVIEWS.

A Monograph of Oriental Cicadidæ. By W. L. DISTANT. Published by order of the Trustees of the Indian Museum, Calcutta. Part I. pp. 24, 2 plates. Royal 4to. 1889. London: King & Co., E. W. Janson. Calcutta: India Museum, and Thacker, Spink & Co. Berlin: R. Friedlander & Sohn. In parts, five shillings each.

Mr. Distant has long been celebrated for his monographs of certain groups of Eastern Insects. In this he bids fair to excel those already issued by him. The fauna of the Cicadidæ treated in this work comprises Continental India, Ceylon, the islands in the Bay of Bengal, Burma, the Malay Peninsula, the Malayan Archipelago, and China and Japan. This area was not chosen by the author, but was selected at the request of the Indian Museum authorities. No monograph has previously been attempted, and Walker's "species" will now be analysed, and, where admitted, figured. Most of the Continental museums have placed the whole of their collections of the family in the hands of the author, who, with his own unrivalled collection, and those of the Calcutta and British Museums, has seen all available material.

The author has written in the style of his 'Rhopalocera Malayana,' to which this will form a companion volume. The production of the work is alike admirable for its scientific value, the accuracy of drawing of figures (some being coloured) on the plates, which are by Mr. Horace Knight, and the general production by Messrs. West, Newman & Co. It will evidently become a standard work on the Eastern Cicadidæ.—J. T. C.

Notes on an extraordinary Race of Aretia mendica, Linn. By GEORGE T. PORRITT, F.L.S., &c. 2 pp. 8vo, 1 coloured plate.

This is a reprint of a paper read before the Ent. Soc. Lond., July 3rd, 1889, and will be found useful to those who make special study of variation in the Lepidoptera. Most of the remarkable forms figured are now well known to British lepidopterists, but they have not hitherto been figured for comparison upon one plate. When thus seen, we get a better estimate of the value of variation, which in this case seems to point to an immediate formation of a very distinct local race—dark, like some Lepidoptera occurring in Lancashire and Yorkshire, if such race has not long existed near Huddersfield, and been overlooked, which seems improbable. —J. T. C.

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